WOOD WORKING digest

JANUARY 1952

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A HITCHCOCK PUBLICATION

THE INDUSTRY'S *No. 1* PUBLICATION

in

- Editorial Content
- Advertising Volume
- Effective Circulation

PUBLISHED MONTHLY SINCE 1898

DRIVE STANDARD 12 GAUGE ROUND SASHPINS

AUTOMATICALLY!

The dependable, production-tested Spotpinner automatically drives—and countersinks to suit—the familiar round 12 gauge sashpin to produce quality millwork at substantially lower cost.

The new Spotpinner has a double capacity magazine contained entirely within its virtually indestructible molded frame.

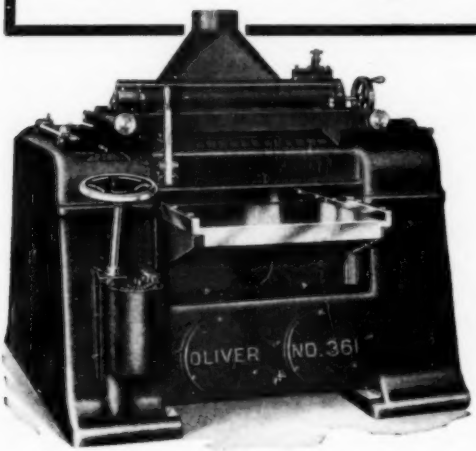
Spotpins are galvanized for rust resistance—knurled for better holding power—chiselpointed to avoid splitting check rails and muntins. Spotpins are round, straight (no offset) and cohered in sticks for quick magazine loading.

Write for new Spotpin circular today!

Spotpins are made in standard ⅞", 1" and 1⅛" sizes.

SPOTNAILS, INC. EVANSTON 1, ILL.

"OLIVER" No. 361-BD
36-in. Single Surfacer



11 new features to give you the finest production planing –at lower cost

1—**Dial control shows exact thickness of cut.**

2—**Enclosed feed mechanism.**

3—**One-piece base.**

4—**One-piece inclined bed casting.**

5—**One-piece inclined wedge casting.**

6—**One-piece upper housing.**

7—**Weight of machine carried on two strips running length of base.**

8—**Four-knive easily adjusted ball bearing cylinder.**

9—**Enclosed worm gear drive for feed rolls.**

10—**Perfected lubricated chipbreaker.**

11—**Centralized finger tip control.**

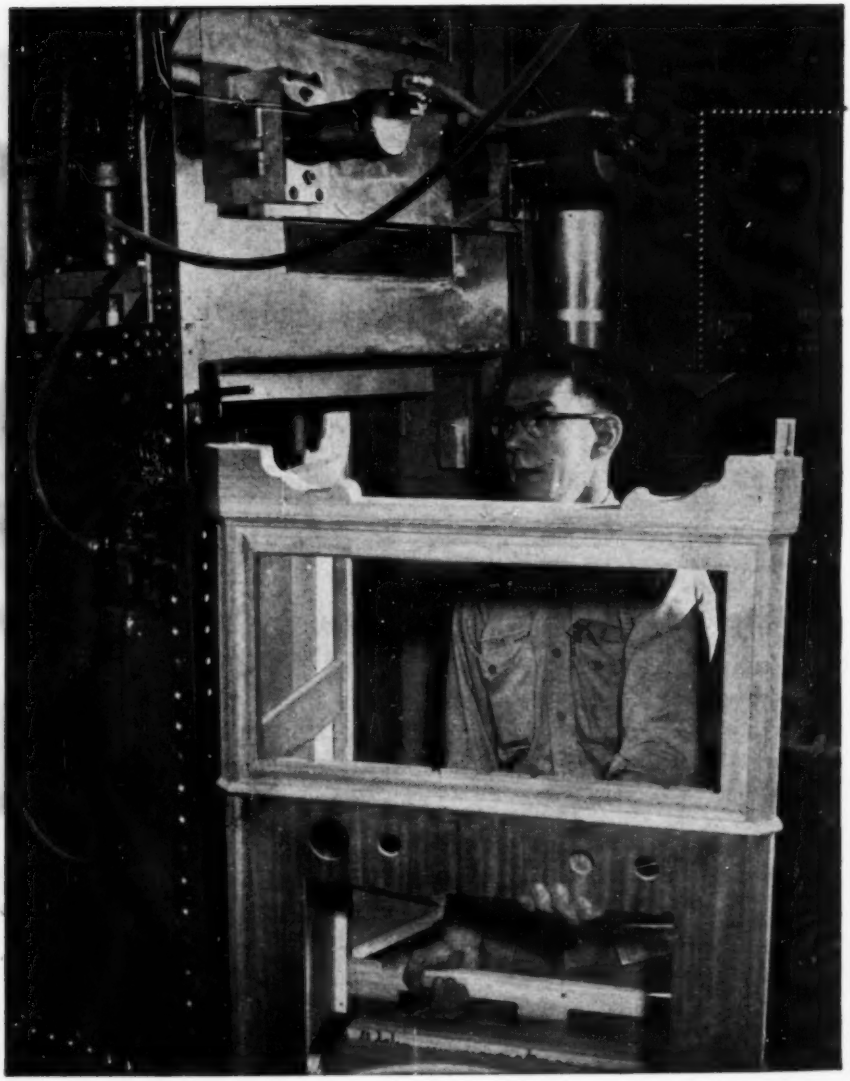
Finer planing at minimum cost . . . that is the record of the "Oliver" 36-in. Surfacer. Its advanced design, plus "Oliver" precision construction, make it the best machine in its field. It planes stock up to 8 inches thick. Has four rates of feed: 20, 30, 40, 60 feet a minute—faster or slower if desired. And its fine planing also reduces sanding and finishing costs. **Write for Bulletin No. 361-BD.**

OLIVER

OLIVER MACHINERY CO., GRAND RAPIDS 2, MICH.

YOU CAN BE SURE... IF IT'S

Westinghouse



EVER SEE A

$27,000

BOOTSTRAP?

Lifting yourself by your bootstraps can't be done—it's said. Yet, the Red Lion Cabinet Company of Red Lion, Pennsylvania, has lifted gluing production rates by 25%. And by this "bootstrap" lifting, they save well over $27,000 a year. This saving covers only two of the many Westinghouse RF heating installations applied to operations in their production lines. EACH INSTALLATION HAS PAID FOR ITSELF IN LESS THAN A YEAR!

On one sub-assembly operation, for example, Red Lion uses a 10 KW Westinghouse generator for RF stray field heating. Production increased 25%; savings topped $14,000 yearly.

For each final assembly, a 5 KW generator is used to do the job. Production has increased 25%; direc annual savings are over $13,000 for each final assembly set-up. As a result, the Red Lion Cabinet Company is completely equipped with Westinghouse RF heating.

Let us help you analyze *your* woodgluing problems. Take advantage RIGHT NOW of Westinghouse RF equipment and experience.

We'll be glad to send Booklet B-3946-B, "*Radio Frequency Heating for the Woodworking Industry*". Call your local representative, or write Westinghouse Electric Corporation, Dept. W-2, 2519 Wilkens Avenue, Baltimore 3, Maryland.

Write Today!

Westinghouse

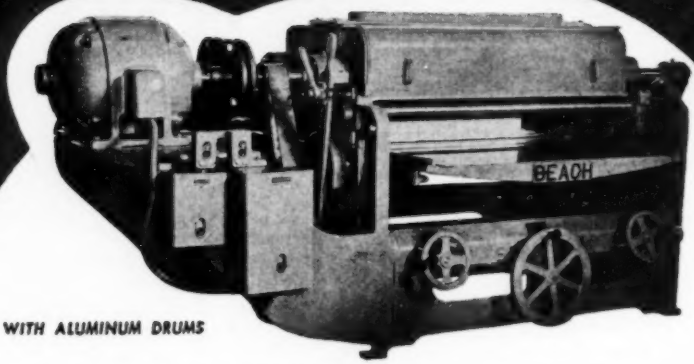
RF HEATING

WESTINGHOUSE

J-02204

BEACH

TWO DRUM SANDER



WITH ALUMINUM DRUMS

This new model BEACH SANDER combines many quality features and is adaptable to all types of drum sanding. Its simplicity of design cuts upkeep expense. Aluminum drums help give a fine finish.

Install a BEACH SANDER for easy operation and positive power feed. Write for complete details.

Beach MANUFACTURING CO.
MONTROSE, PENNSYLVANIA

Woodworking digest

JANUARY, 1952 — OUR FIFTY-FOURTH YEAR

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HAVE A SPECIAL CUTTING PROBLEM ?
There's a Shimer Head for every purpose

Manufacturers Of The THE SHIMER CUTTER HEAD Shimer Cutter Heads

SAMUEL J. SHIMER & SONS, Inc.

MILTON, PENNA.

Here's how to slash your Bonding Cost by 25%!

USE PENACOLITE® ADHESIVE G-1260
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IT COSTS ¼ LESS THAN STRAIGHT RESORCINOL ADHESIVES

GIVES COMPARABLE RESULTS
(proved by Vacuum-Pressure Cycle Tests)

● By using phenol-modified Penacolite Adhesive G-1260 you save nearly half the scarce resorcinol otherwise required—an important factor in view of the current shortage of resorcinol due to heavy defense demands, and resultant restrictions on resorcinol by NPA.

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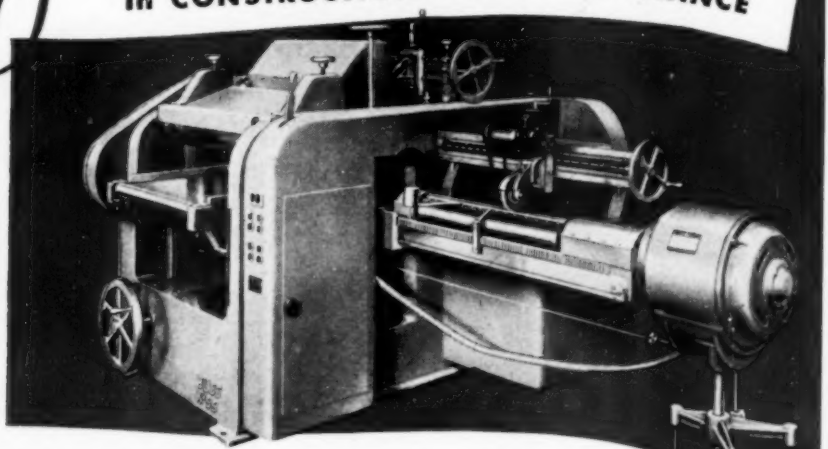
SPECIAL WOODWORKING MACHINES

745 — 51st STREET, BROOKLYN, N.Y.

for DOUBLE SURFACING ROUGH LUMBER the BUSS No. 55 is YEARS AHEAD in CONSTRUCTION and PERFORMANCE



If you are looking for the fastest, best and most economical way in which to surface rough lumber, be sure to get the complete details of our No. 55, 30" x 14", Heavy Duty Double Surfacer. It's years ahead of any other planer built for this purpose as a simple comparison of salient features will readily disclose. Note the following structural superiorities:

1. Variable feed — from 30 to 175 ft. per minute. 2. Chromium plated beds and bars — for longer wear. 3 Heavy built-in grinders and jointers. 4. Anti-friction ball and roller bearings throughout. 5. Sectional feed roll and chipbreaker. 6. Large diameter cutterheads with high-speed TUNGSTEN knives for longer wear and smoother finish. 7. Completely motorized with push-button control. 8. Shearing Bar to prevent damage from loose knots. 9. ONE-SHOT lubrication for smooth running and insurance against neglected parts. Write for complete description. Ask for bulletin 55.

FLOORING MILLS and KINDRED PLANTS

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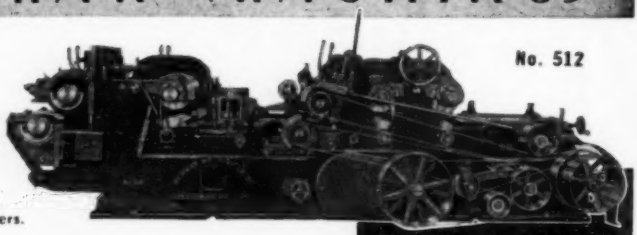
BUSS
SINCE 1862
MACHINE WORKS

234 EIGHTH STREET
HOLLAND, MICHIGAN

NEWMAN MACHINES

Newman

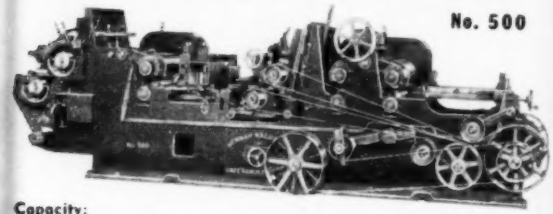


No. 512

Capacity: 16" and 24" wide, 8" thick.
Speeds up to 325 feet per minute.
8" dia. cutting circle.
Six 12" dia. feed rolls.
Single and double profilers.

BALL and ROLLER BEARING PLANERS AND MATCHERS

No. 500



Capacity:
14" and 24" wide, 6" thick. Speeds 40 to 200 feet per minute. 7" cutting circle. Six alloy steel feed rolls. High carbon special alloy steel cylinders. Single or double profilers.

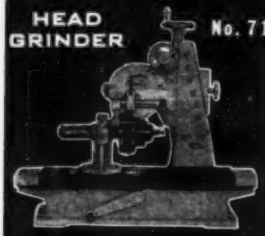
ORDER NOW FOR EARLY DELIVERY

ALL NEWMAN cylinders or heads are DYNETRICALLY BALANCED insuring an accurate and superbly finished product.

Ball and Roller Bearings

The ball bearing NEWMAN 71 (shown below) will grind all sizes of cutter heads. Table is 33" long by 9" wide with horizontal travel of 25" and is heavily ribbed to maintain accuracy over entire travel. Maximum cutter head swing is 11".

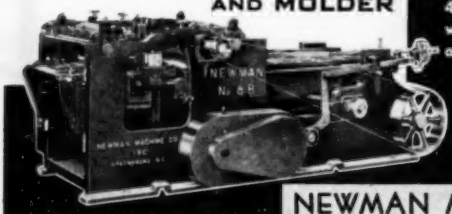
HEAD GRINDER **No. 71**



No. 55 AUTOMATIC PINEAPPLE FEED TABLE

The NEWMAN 55 feeds stock automatically to high speed planers and matchers up to 450 lineal feet per minute. Capacity: 30" wide, 8" thick. All adjustments and controls are centrally and conveniently located.

No. 8-B PLANER, MATCHER AND MOLDER



The NEWMAN 8-B planes 22" wide and 8" thick, joints 4" thick and will match 14" wide. 6" diameter feed rolls. Speeds of 30, 50 and 75 feet per minute.

Unsurpassed for work in small and medium mills

MAY WE SEND YOU FULL DETAILS?

NEWMAN MACHINE COMPANY, INC.
GREENSBORO, NORTH CAROLINA, U.S.A.

The Right Glue for your job!

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or in DRUMS

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- ★ Laminating hardboards, veneer splicing, laminated rafters.
- ★ Glues to pass all government specifications.

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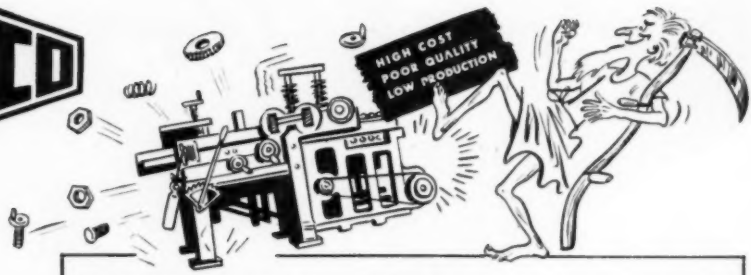

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Bring in the New!

INSTALL AN

EKSTROM CARLSON

HI-SPEED MOULDER

IN YOUR PLANT

1952 is a good year to bring your moulding machinery *up-to-date.* Make it a real Happy New Year for yourself, your employees, and your customers. An ECCo Hi-Speed Moulder will bring better results all around — lower costs for you, easier production for your employees, and better quality products for your customers. Father Time has done his best for you, but it is time now to kick out that old bag of bolts and hank of haywire — and let a boy that *CAN* do a man's job step in. Let us give you our timely story of modern moulding . . .

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MANUFACTURERS OF

Solid Maple Furniture

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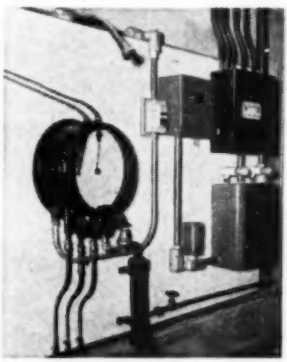
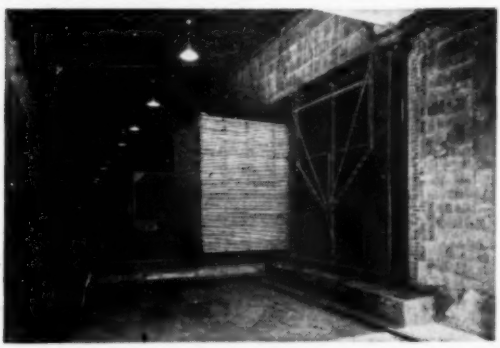


Accurate control equipment maintains ideal heat, humidity and ventilation conditions in the firm's Standard Dry Kilns.



Kiln loading at Sprague & Carleton is an important part of this firm's production procedure.

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Write for illustrated Standard Catalog

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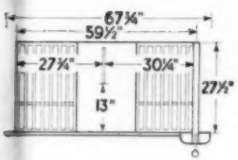
BALL BEARING EQUIPPED

- ★ Cuts 3¼" Deep
- ★ Precision-Ground
- ★ Table and Extensions
- ★ Tilt/Arbor
- ★ Construction
- ★ Dual V-Belt Drive

Perfect for Piece-Work Sawing



SOLIDLY built, with the precision and rugged strength of a metal working tool, this Atlas 10" saw can add new versatility and new production speed to your shop. It handles large stock easily — the ground grey-iron table and extensions give plenty of support for big boards, panels.

On small work, the quick-adjusting rip fence with vernier control can save many valuable minutes every day. Get all the details about this perfectly designed production saw. Send for latest catalog.

Quick-Set Rip Fence
Quick-Set Rip Fence locks or releases instantly, slides to position, lifts off! Saves time every time it's used.

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KALAMAZOO, MICHIGAN

Atlas
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STRAIGHT-LINE ACTION LEAVES NO MARKS

21 SQUARE INCHES OF SANDING SURFACE

14,400 SANDING STROKES PER MIN.

(Patented)

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EASY ONE-HAND OPERATION

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There's no need to get yourself out on a limb looking for coated abrasives. Just look to Armour.

Many woodworking jobs require special abrasives—and many use just regular abrasives. Whatever job you're doing, Armour has a *complete* line of quality coated abrasives for every woodworking job.

This Armour line includes paper, cloth or combination rolls in either Electrocoated Garalun or Heat Treated Garnet. There are sheets of cabinet paper as well as belts, discs, and specialized forms of coated abrasives.

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WHITNEY

A New Single Spindle Shaper

- Economical to operate
- Produces quality work
- Lower in price

WHITNEY 510 SHAPER

Specifications: 2 HP Motor; Table, 36" x 31"; Spindle Speed, 10,500 RPM; Spindle from front of table, 13½"; Vertical adjustment, 3½"; Detachable Top, ⅞" dia. by 5"; Approx. weight, 750 lbs.

The WHITNEY 510 Shaper is designed for medium to light production, handling with ease and accuracy a wide variety of furniture and novelty parts, panels, tops, handles and backs.

This new shaper is of typical Whitney quality construction. An entirely new design permits many manufacturing economies without deviating from Whitney high standards of accuracy and quality.

For a low cost, economical shaper for precision and fine production work don't miss this opportunity to get acquainted with the features of this shaper. Send today for complete information. Ask for Bulletin D1.

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BAXTER D. WHITNEY & SON, Inc.

FINE WOODWORKING MACHINERY

PLANERS • SHAPERS • VARIETY SAWS • MORTISERS • BACK KNIFE LATHES

WINCHENDON, MASSACHUSETTS, U. S. A.

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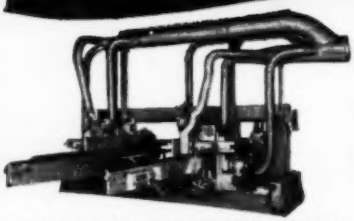
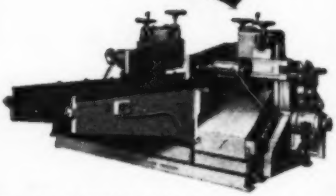
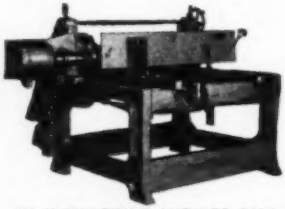


No. 400 DOUBLE-END TENONER. Made to fit your requirements in sizes up to 20'. Will square-cut up to 96" ahead of trim saws. Many accessories to increase usefulness. **Ask for bulletin No. 400.**



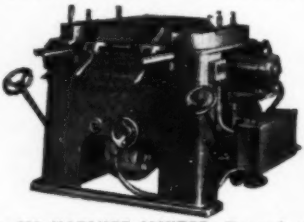
No. 300 DOUBLE CUT-OFF SAW. Accurate production at high rates of speed. Labor saving attachments such as cope motors, dado arbors and other devices are available for specific needs. **Ask for bulletin No. 300.**

No. 442MT COMBINATION SAW. Versatile machine for ripping, cross cutting, grooving, dadoing, beveling, mitering. Cuts up to 48" wide and rips up to 50" wide. Easily handles large stock. **Ask for bulletin No. 442MT.**



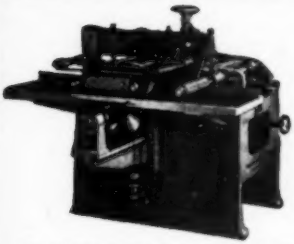
No. 435-H MULTIPLE CUT-OFF SAW. Cuts long boards into short pieces . . . will square up any size sheet . . . and will cut any number of grooves. It's an excellent plywood sizer. **Ask for bulletin No. 435-H.**

VERTICAL BAND RESAW. Eight feed rolls eliminate "stock wobble." Sizes 48" to 60". Variable feed drive; 100% ball and roller bearings. 54" Twin Band Resaw Combination band rip and resaw. **Ask for the Resaw bulletin.**

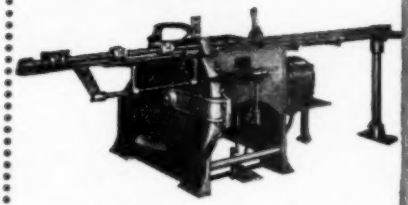


No. 326 MATCHER-JOINTER. For sash and door, furniture and box factories—as well as many special uses. Adaptable for "T" and "G" work. **Ask for bulletin No. 326.**

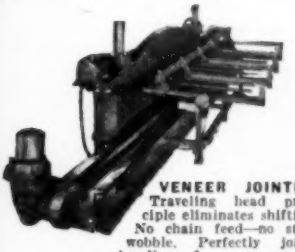
Merrow-Johnson MACHINES



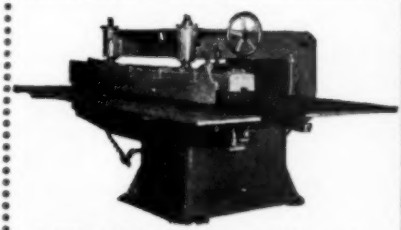
o. 441 GANG RIP SAW. For fast produc-on on the most difficult gang ripping jobs. ix power driven feed rolls . . . 12" or 19" w space . . . up to 125 HP . . . variable ed drive up to 300 ft. per minute. **Ask for ulletin No. 441.**



No. 447 CUT-OFF SAW. Capacity equals two or three swing, straight line or roller carriage cut-off saws—depending on the type and condition of the stock. Excellent for box work. **Ask for bulletin No. 447.**



VENEER JOINTER. Traveling head principle eliminates shifting. No chain feed—no stock wobble. Perfectly joints bundles of veneer up to four inches thick. Sizes from 90" to 212". **Ask for the Jointer Bulletin.**



VENEER SPLICER. Makes precision tapeless joints. Adjusts itself automatically for varying thicknesses of veneer normally encountered. Welded steel frame with 49" throat clearance at right. **Ask for bulletin No. 50.**

The experience—the equipment—the manpower for producing *Precision Machines.*

Merrow-Johnson MACHINE COMPANY

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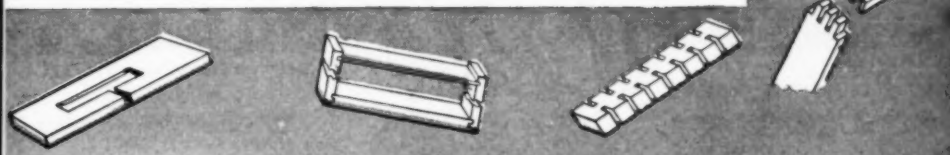
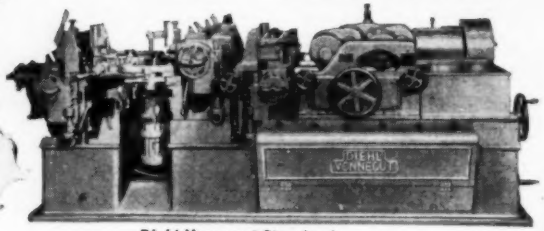


TORRENTS of work...



Diehl-Vonnegut Standard
4-Head Moulder—available in sizes
4"-6"-8"-10"-12".

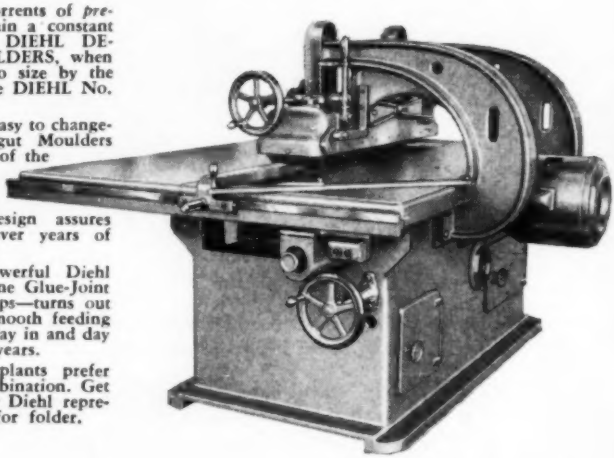
flow from this unbeatable combination.

Yes, unending torrents of *precision* work maintain a constant profit flow from DIEHL DEPENDABLE MOULDERS, when fed stock ripped to size by the Super Rip Saw—the DIEHL No. 750.

Easy to operate, easy to change-over, Diehl-Vonnegut Moulders are the workhorses of the high speed, precision woodworking industry. The exclusive Spindle design assures highest accuracy over years of trouble-free service.

The smooth, powerful Diehl No. 750 Straight Line Glue-Joint Rip Saw is also tops—turns out accurate cuts for smooth feeding through moulder—day in and day out—for years and years.

Profit-producing plants prefer this unbeatable combination. Get the story from your Diehl representative or write for folder.



Diehl No. 750
Straight Line Glue-Joint Rip Saw.

On the Banks of the Wabash

THE G. M. **Diehl** MACHINE WORKS, INC.

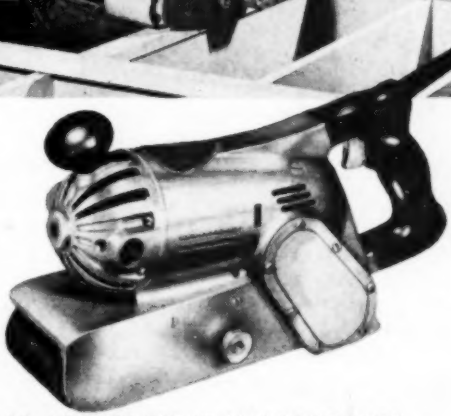
WABASH, INDIANA • U. S. A.

"This eight year old SKIL Belt Sander still gives top performance!"

—SAYS **ELDON REED,**
KING BROTHERS CABINET CO.
KANSAS CITY, KANSAS

"In fact," Mr. Reed adds, "we have had *two* 3-inch SKIL Belt Sanders in constant use for the past eight years, and both have demonstrated SKIL quality beyond comparison. SKIL Belt Sanders are not only durable," he goes on to say, "but they have the correct weight, power and belt speed for producing the best finished surface on all types of wood."

SKIL Belt Sander—Model 448. 3" Belt Sander. Belt speed: 1200 feet per minute, no-load Pulleys: 2¼" diameter. Belt: 3" wide—centered by convenient adjusting knob. Size overall: 4¼" wide x 15¼" long x 8½" high. Net weight: 15¾ lbs.



SKIL Saw

SKIL Drill

SKIL Disc Sander

THERE'S A SKIL BELT SANDER TO ANSWER EVERY FINISHING NEED

See your Distributor for Complete Information or call your nearest SKILSAW Factory Branch.

SKIL

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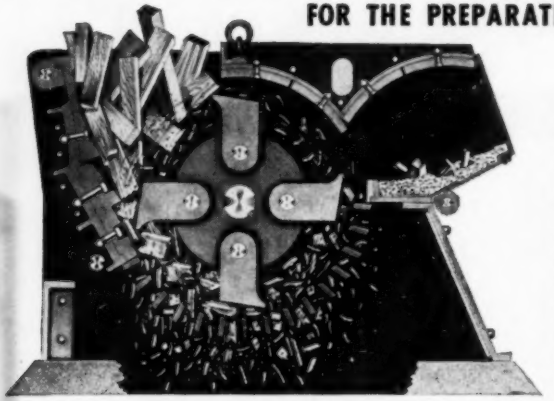
WILLIAMS "NO-NIFE" HOGS

FOR THE PREPARATION OF WOOD REFUSE FOR BOILER FUEL



Sectional drawing of Williams "No-Nife" Hog showing how the fast revolving hammers cut the wood refuse by impact.

Williams new and improved "No-Nife" Hogs are now offered for use in all wood working plants. Experience has proven, that when properly handled, wood refuse is the cheapest fuel for all wood working plants. Therefore, the wood refuse utilized in this manner not only insures a proper fuel supply, but also provides a convenient and economical method of cleaning the refuse from the mill and disposing of it without additional expense.

Hog fuel as made with the improved "No-Nife" Hog.

ALSO USED FOR REDUCING WET OR DRY VENEER AND PLYWOOD SCRAP

The Williams "No-Nife" Hog will reduce wet or dry Veneer and Plywood Scrap to a uniform size wth no long slivers or big pieces—thus the finished product can easily be handled in pneumatic air lines. No need to worry about elbows of your system becoming clogged. Hundreds of satisfied users attest to their dependability.

WCS1-2

CHECK ✓ THESE FEATURES

- Many sizes of "No-Nife" Hogs to choose from.
- Adjustments to overcome wear.
- Larger feed opening.
- Hinged cover—instant accessibility.
- No knives to sharpen or be damaged by tramp iron.

WILLIAMS ALSO MAKES...

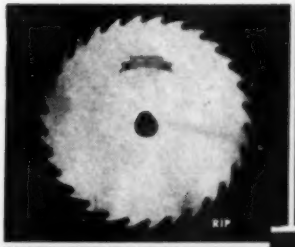
Hogs and Shredders for making wood flour and sawdust. Vibrating Screens and Air Separators to work in closed circuit with our Shredders for absolute control of product size.

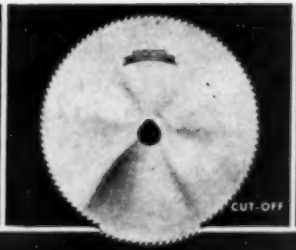
Williams Patent Crusher & Pulverizer Co.

808 St. Louis Ave. • St. Louis 6, Mo.

WILLIAMS

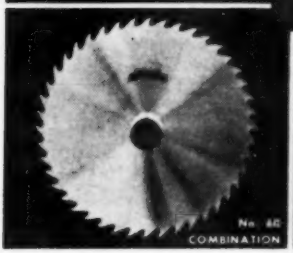
CRUSHERS GRINDERS SHREDDERS





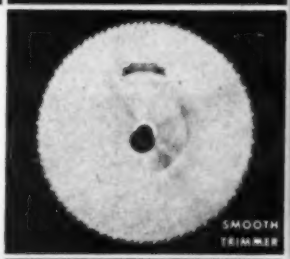
Fe... Type of Cutting
...Type of Machine...

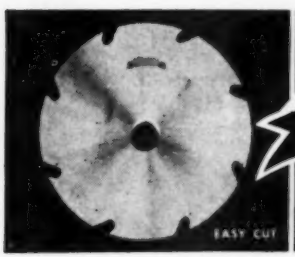
"SIMONDS SAWS ARE THE BEST"



Simonds Saws are 100% Quality Controlled . . . from the tough, edge-holding electric furnace steel poured in Simonds own modern mills . . . to the special methods of heat-treating, grinding, tensioning and fitting by Simonds experienced sawmakers working under ideal conditions in the world's most up-to-date saw-manufacturing plant.

This "start-to-finish" control is your guarantee that every Simonds "Red Center" Saw you buy will cut smooth, fast and straight . . . will stand up to fast feeds . . . and will hold its cutting edge in the hardest woods. Your Simonds dealer is stocked to serve you . . . get in touch with him *today*.

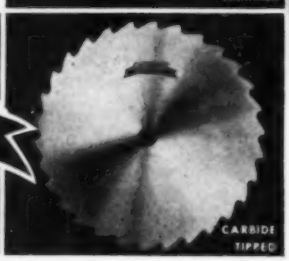




Serving Industry Since 1832

SIMONDS
SAW AND STEEL CO.

Factory Branches in Boston, Chicago, San Francisco and Portland, Ore.. Canadian Factory in Montreal, Que.



Wapakoneta Knives

ASSURE HIGH SPEED PRODUCTION

BIG CHIEF

The most dependable knife for general purpose high production work.

KNIFE SPECIALISTS
SINCE 1891

MOHAWK

Can withstand hard knots in Southern and similar soft woods.

THE WAPAKONETA MACHINE COMPANY

WAPAKONETA, OHIO

You can count on

Continental

SIX ACRES OF PRODUCTION

Continental has more than six acres of plant production for making HOLTITE and other screw fasteners. Equipment and facilities are unsurpassed. Products consist of a complete line of commercial and industrial fasteners in all standard sizes, types, styles, metals and finishes with slotted or Holtite-Phillips recessed heads. Special fasteners can be made to your exact specifications.

HOLTITE Screws are the kind of fasteners that make America strong. They bind our nation together and keep it from splitting out at the seams. They hold our automobiles and aircraft, our ships and trucks and trains together. Without them we would have no radios, refrigerators, dishwashers or appliances. They are an integral part of the machine tools that make the machines that multiply the productivity of our labor. They even fasten the doors to our homes. In peace or war they are sinews of strength.

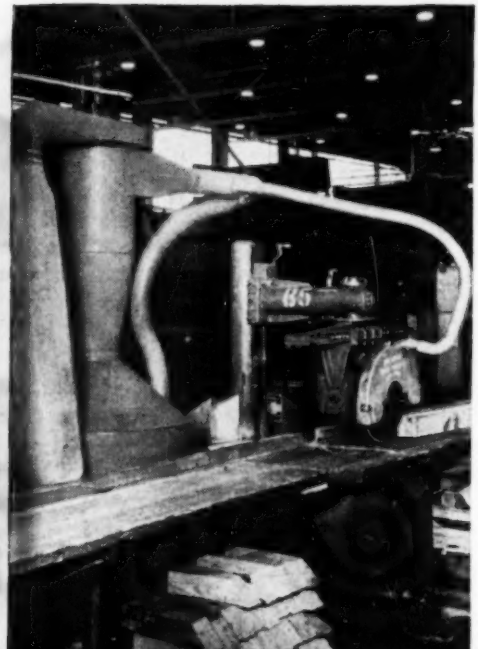
Whenever you need to put things together better, faster or stronger *you can count on* HOLTITE *fasteners and the Continental Screw Company,* New Bedford, Massachusetts.

LEVOLOR LORENTZEN, INC., 391 West Broadway, New York 12, N. Y.
Exclusive Distributors of HOLTITE Screws to the Venetian Blind Industry

CONTINENTAL SCREW COMPANY
INC. ★ 1904

HOLTITE *Engineered* FASTENINGS

TORIT DUST COLLECTORS



Keep the "chips *from* flying" on this swing saw.

The circular saw shown here is used for cutting hardwood timbers. Suction pipes attached to the wheel enclosure lead to a TORIT 13-FB Dust Separator. The heavier particles are removed by the cyclone unit, and fine dust by the after-filter.

This Torit installation eliminates the need of a central dust system, with its maze of expensive piping. Operating only when the saw is running, it cuts operating costs. Furthermore, it recirculates the cleaned air to maintain room temperatures.

Both cabinet and cyclone-separator type TORIT Dust Collectors are available in special purpose units with extra large storage reservoirs. Especially suitable for handling wood working dust problems, they offer real savings in installation, operating and maintenance costs. For details and the latest TORIT catalog, write:

Torit Dust Collectors are also available in self-contained cabinet type units for carrying away dust-laden air around grinding, cutting and polishing wheels.

TORIT
MANUFACTURING CO.
294 WALNUT ST. • ST. PAUL 2, MINN

An ideal tool of many uses for production-line repetitive operations —

the DELTA UNISAW

It's truly a universal saw as its name implies —a 10-inch tilting arbor saw for mass-production woodworking shops.

It makes a 3⅛ inch cut, tilts to 45°, cuts to center of a 50-inch panel—makes perfect mouldings with moulding head attachment, cuts dados; does countless jobs accurately, at high speed, at low cost.

There's a place in your shop for this time-saving, money-saving, dependable Unisaw. The initial investment is moderate, and operating savings will quickly repay it.

ASK YOUR DEALER ABOUT THE UNISAW—HE'S LISTED IN THE CLASSIFIED PAGES OF YOUR PHONE DIRECTORY UNDER "TOOLS". ALSO SEND FOR THE DELTA CATALOG AB-51—DESCRIBES THE FULL LINE OF DELTA QUALITY TOOLS.

There's a Delta Power Tool for Your Job-

WOOD OR METAL WORKING

53 MACHINES—246 MODELS—

MORE THAN 1300 ACCESSORIES

DELTA POWER TOOL DIVISION

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661 A E. VIENNA AVENUE • MILWAUKEE I, WIS.

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LIGHT and POWERFUL for hundreds of shop uses

The New STANLEY W65 6" Safety Saw

Here's the ideal portable saw for working on crates, patterns, trim or other cutting jobs. The Stanley W65 is compact and sturdy, with the advantages of light weight, powerful motor, and high quality. Latest safety guards provide full protection for the operator. Cutting capacity to 2".

Outstanding features of the W65 include: the multi-grip handle, outside knob on the telescoping safety guard, ball and roller bearings throughout, helical gears, and polished finish. Full weight is only 10 lbs. Quick-set tilting adjustment permits beveling at marked graduations to 45°. The W65 is furnished complete with combination rip and cross-cut blade, wrenches, lubricant, and steel carrying case.

Other Stanley Safety saws available in larger sizes are: W7—2½" cut, W8 — 2¾" cut, and W9 — 3¼" cut. See these Stanley saws at your industrial distributor's, or write for descriptive literature. Stanley Electric Tools, 542 Myrtle St., New Britain, Conn.

STANLEY

HARDWARE • TOOLS • ELECTRIC TOOLS • STEEL STRAPPING • STEEL

Reg. U. S. Pat. Off.

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for the mark of

Serviced Glues!

Expert Gluing Service is a tremendous advantage enjoyed by users of Perkins Glues. They know that if trouble develops—*for any reason*—prompt and efficient help will come from the Perkins representative in their locality and, when necessary, from the Perkins Laboratory Staff. If your plant is not one of those getting the best in Service along with top quality Glues it will pay you well to contact Perkins today.

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HIGH OR LOW SOLIDS • BULK OR DRUM SHIPMENTS

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CATALYST CONTAINED OR CATALYST TO BE ADDED TYPES

Resorcinols and Phenolics
FOR WORK REQUIRING COMPLETELY DURABLE GLUE LINES

Casein and Vegetable Glues
FOR VENEERING, LAMINATION, AND ASSEMBLY GLUING

Plus

PERKINS COROX LIQUID READY-FOR-USE ASSEMBLY GLUE
GLUING EQUIPMENT, SIZING COMPOUNDS, WOOD FILLERS

PERKINS GLUE COMPANY

ESTABLISHED 1899

LANSDALE, PA. **KITCHENER, ONT.**

World's Finest Machine Knives...

ATKINS
"Silver Steel"

THICK and THIN
High-Speed ***PLANER KNIVES***

It's a long time between sharpenings when you use ATKINS *"Silver Steel"* planer knives and shaper blades! . . . Made of the finest steel, correctly beveled, scientifically ground and balanced, these *"Silver Steel"* products will get right down to business more profitably! They cut faster—and keep on cutting far longer—spend more time on the job, *less* time in the grinding shop! . . . For long, continuous, *precision performance*, specify Atkins *"Silver Steel"* and get the *plus* values that assure savings in costs. Atkins Distributors can solve your problems and supply your requirements.

E. C. ATKINS AND COMPANY
402 South Illinois Street, Indianapolis 9, Indiana

ATKINS *Narrow Band and Circular Saws*

"Silver Steel" band and circular saws are the finest that money can buy. Their top quality combines with *plus* performance to assure you of value that means—*more for your money!* Generations of specialized experience go into the manufacture of these superior saws—saws that will save you money and serve you better!

Use—Don't Abuse—FINE TOOLS!

AAA ATKINS

ATKINS

Comments from THE NATION'S CAPITAL

By Arnold Kruckman
Washington Correspondent

Half the plant capacity of woodworking machinery manufacturers has been offered for subcontract production of machine tools and parts, according to NPA. Manufacturers already are doing a large amount of subcontracting work for machine tool builders — producing complete shapers, lathes, and horizontal boring machines and machine tool sub-assemblies and parts.

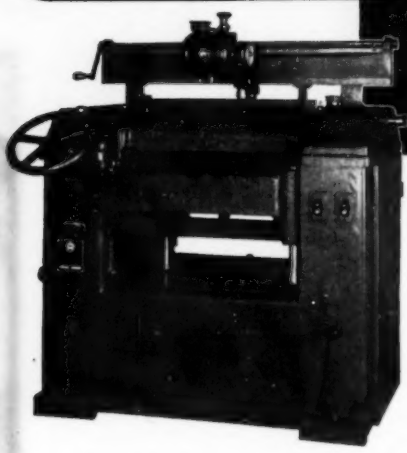
Those who want more machine tool subcontracts are requested to send a complete list of their shop equipment, showing make, type and size of machine tools and foundry capacity, to R. M. Husband, Chief, Subcontract Section, Metal Working Equipment Division, National Production Authority, Washington 25, D. C. Husband has a list of about 75 machine tool builders seeking subcontractors. CMP applications revealed only 3% of woodworking machinery orders come directly from Department of Defense, or Atomic Energy Commission.

Woodworking machinery producers, for the first quarter, percentagewise, compared with what they asked in their applications, received 65% carbon steel; 59% alloy steel; 64% stainless steel; 73% copper brass mill products; 51% copper wire mill products; 70% copper foundry products; and 37% aluminum.

Applications for the next quarter are now in the works. NPA reports lumber product industries have no equipment problems. Military requirements for lumber in 1952 will be the same as in 1951. Wood containers will be 10% higher than in 1950; production of wood furniture will increase substantially to compensate for reductions in metal furniture output.

Increased wood furniture output would specifically be in office and hospital models. Wood office furniture production is now at the same level as in 1949-50, and should increase 50% by the third quarter of 1952. Wood hospital furniture output is 10% above the 1949-50 level, and should increase 10% more during the first half of 1952.

DIVIDEND DESIGN gives the PORTER 405 SURFACER 5 Big Advantages



- HIGHER SPEED OPERATION
- PREMIUM CAPACITY
- FASTER ADJUSTMENT
- EASIER OPERATION
- LONGER LIFE

Because of Dividend Design, a Porter 405 Surfacer will handle more lumber at lower cost than ordinary machines. Its extra margin of speed, capacity and strength produces heavier cuts, smoother work and a more profitable operation.

DIVIDEND DESIGN makes the Porter 405 Surfacer extra fast for surfacing at higher speeds. A matched "V" belt drive rotates the cutterhead at 6,000 RPM to assure clean, smooth, perfect work. This high speed is made practical by the newly designed chipbreaker which keeps the machine running free at all times.

DIVIDEND DESIGN permits heavier cuts on a Porter 405 Surfacer. Free and easy cutting action makes possible the use of an increased blade angle without increasing the size of the motor. This means greater surfacing capacity with no rise in power costs.

DIVIDEND DESIGN simplifies adjustment of a Porter Surfacer. The operator quickly varies the rate of feed even as the lumber moves through the machine.

DIVIDEND DESIGN makes it easier to surface pieces of many different sizes and shapes. Individual magnetic controls prevent operation of the feed unless the cylinder is running. All rolls are power driven.

DIVIDEND DESIGN prolongs the life of a Porter Surfacer. It has the extra strength and extreme rigidity of welded steel, ribbed construction. This provides a durability achieved only with excessive weight with cast iron.

Write today for complete information on the advantages of Porter **DIVIDEND DESIGNED** *machinery*

C. O. PORTER Machinery Co.

668 Front Ave., N. W. Grand Rapids 4, Michigan

NPA encourages use of lumber products as substitutes for scarce metals. It says sufficient woodworking machinery is now available for current consumption of lumber products.

NPA officially designates as scarce: lumber (except railway cross ties, mine ties and hardwood flooring); plywood (softwood and hardwood); wood poles and piles.

The softwood plywood manufacturing industry, advised NPA, can meet demand for the products from defense and defense-supporting needs — especially exterior and interior grades. Good demand for exterior, but not so good for interior grades.

It may be useful to make a record of the information that John M. Camp is Director of NPA Lumber and Wood Products Division. His office is at 2M7 New General Accounting Office building. His telephone is Sterling 5200, extension 3707.

H. E. Holman is Deputy Director. A. D. Vackary is Acting Chief of NPA Wood Container Section.

Lumber and Woods Products Division is part of the Chemicals, Rubber and Forest Products Bureau, headed by Kenneth Klipstein, Director, whose office is at 2Y1, New General Accounting Office building, Sterling 5200, extension 4241.

Wooden clothespins, first under Consumer Durable Goods Division, was transferred to the Forest Products Division, OPS. OPS recently set up price controls on hardwood tobacco hogsheads and parts; wooden mine materials; railroad ties; wooden clothespins (in the turned, shaped and allied wood products order); and set up dollars and cents price ceiling in CPR-97 for Pacific Northwest logs.

Used Tight Cooperage Industry wants tailored regulation from OPS, patterned after old OPA MPR-544, which covered barrels and other containers.

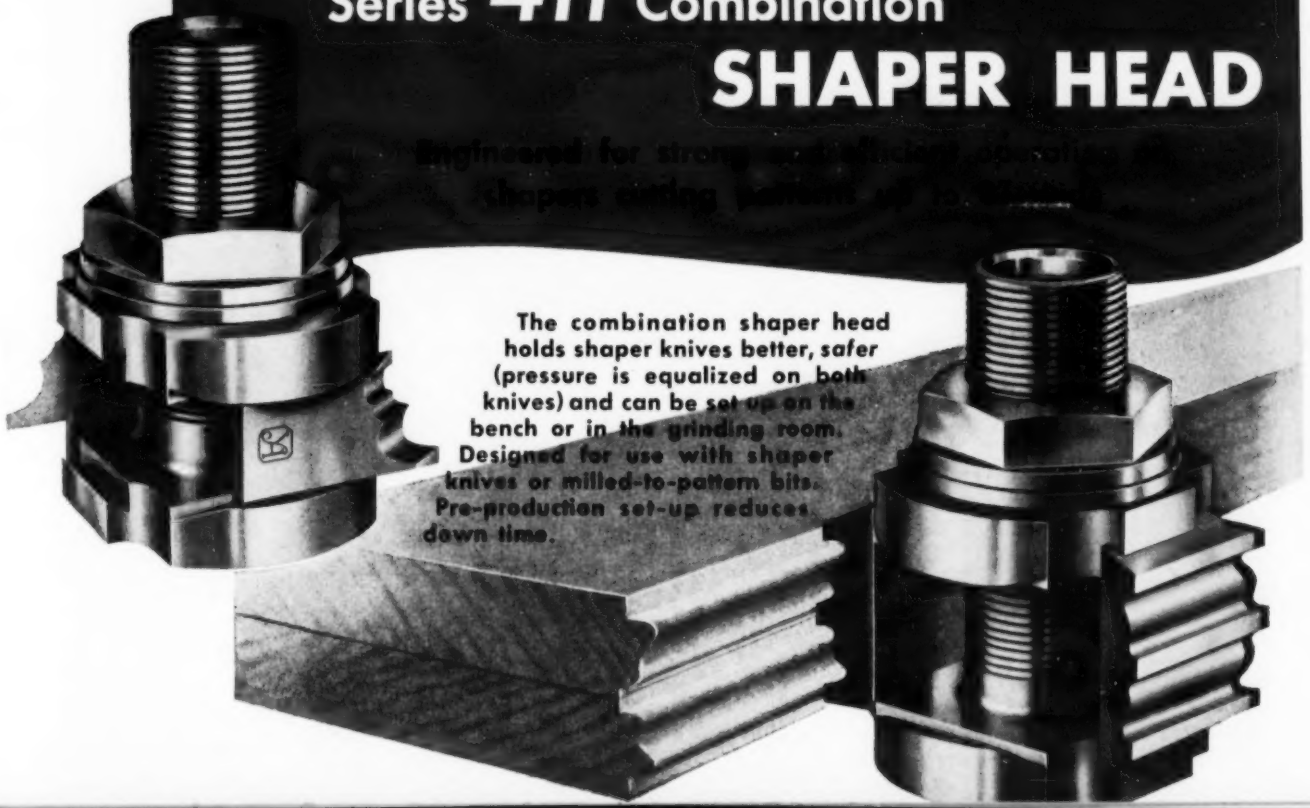
Hardwood Dimension Manufacturers came here to urge greater use of laminated wood products in the military program, as possible substitutes for scarce steel and other metals. Hardwood is far more plentiful than the demand for the products.

Industry's business fell to approximately 50% of normal the middle of 1951, due chiefly to restrictions on home building. Upturn is expected in 1952, not only through increased demand for flooring but because an important part of the output goes into new furniture.

NPA promised to push substitution of hardwood, either solid or laminated, wherever it can do the job. The industry was requested to supply a list of 25 or 50 items for which wood might again be used. During World War II the Military used products of wood in instrument cases, chairs, desks, beds, tables, tent poles, truck body parts, dummy shells and many other items.

OPS Forest Products Division is headed by Rufus I. Worrell, Director, Room 1011 Tempo Building S, telephone Sterling 4200, extension 5653. Assistant Director is M. White Smith at Room 1011 Tempo Building S, telephone Sterling 4200, extension 5663.

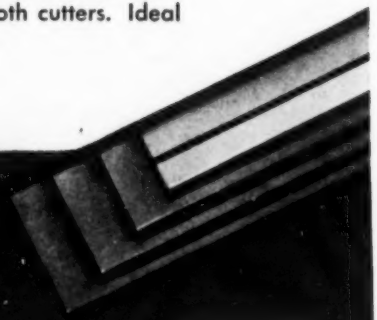
Series 411 Combination
SHAPER HEAD



The combination shaper head holds shaper knives better, *safer* (pressure is equalized on both knives) and can be set up on the bench or in the grinding room. Designed for use with shaper knives or milled-to-pattern bits. Pre-production set-up reduces down time.

A GREAT SAVINGS IN TIME AND EXPENSE, SET-UP AND MAINTENANCE . . .

with this Yates-American shaper head. A combination of shaper collars and a 2-bit vise-grip head, two slots are machined to receive standard shaper steel, and the other two slots are machined to receive dovetail milled-to-pattern bits. Head will use hand ground knives for short runs or two milled-to-pattern bits for long or often duplicated runs. Ball seat clamping arrangement assures equalized pressure on both cutters. Ideal for use with Tungsten Carbide Tipped Bits.



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Norman Cruver is Chief of the Lumber and Wood Products Branch at Room 1213 Tempo Building S, telephone Sterling 4200, extension 8869; the Millwork Section is headed by Glenn Converse as Chief, located at 1200 Tempo Building S, telephone Sterling 4200, extension 8068.

The West Plywood and Veneer Section has as Chief, Philip Garland located at 1200 Tempo Building S, telephone Sterling 4200, extension 8067. James M. Owens is Chief of the Eastern Plywood and Veneer Section in 1217 Tempo Building S, telephone Sterling 4200, extension 8066.

Leonard Perez is Chief of the Miscellaneous Wood Products Section in Room 1219 Tempo Building S, telephone Sterling 4200, extension 8068; and Bernard Topkis is Acting Chief of the Miscellaneous Wood Section in Room 1219 Tempo Building S, telephone Sterling 4200, extension 8068.

The Wood Container Section is under Stanley C. Craven as Chief, whose address is Room 1011 Tempo Building S, telephone Sterling 4200, extension 8869.

ECA is in the market for prefabricated buildings to ship to Thailand. They must be adapted to the tropics. Get in touch with the General Service Administration, 7th and D Streets, attention Mr. M. B. Sandidge, Room 7123 B — telephone Executive 7500, extension 5288.

Government of Formosa wants woodworking machinery. Negotiations are made through ECA Office of Small Business, 806 Connecticut Avenue, N. W., Washington, D. C.

ECA seeks capital for a French concern which makes a treated wood used to light fires. ECA also wants some more woodworking machinery for Thailand as well as for other Southeastern Asiatic nations. Write to the Office of Small Business of ECA at the address already given.

The Philippines, through the ECA, seek lumber sawmill products and lumber products. Also,via ECA, an Italian firm seeks help from any American in producing various items from pressed wood.

Six different ECA mission chiefs in Asia ask for catalogues from business houses covering all descriptions of wood products, and woodworking machinery. Write Office of Small Business, ECA, 806 Connecticut Avenue, N. W., Washington 5, D. C. for the list.

New Federal specifications sponsored by the General Services Administration are expected to remove restrictions requiring warehouse, stevedore and shipping pallets for Government use to be made of hardwood. Douglas fir is to be permitted.

Army specifications have been expanded to permit use of native woods in construction of folding camp tables. Specifications now include Sitka spruce, black spruce, red alder and big-leaf maple for table tops; big-leaf maple also may be used for table legs.

Use of plywood as substitute for scarce metals was emphasized at a recent meeting in the Pentagon by Robert M. Hatfield, Jr., Acting Vice Chairman of the Munitions Board for Production

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and Requirements. He stressed that Unicel plywood is used in freight cars now being tested by the Army Transportation Corps.

A directive has been issued to the Army, Navy and Air Force establishing a policy of specifying the grade of plywood that properly fits its use in the interests of conservation. Use of both softwood and hardwood plywood is encouraged.

Corps of Army Engineers, solely responsible for procuring all the plywood used by the three Military Departments, made clear it secures the plywood specified by those who use it. Harry T. Kendall, Munitions Board Consultant on forest products has urged there are many ways, not yet developed, in which plywood and lumber can be made to supplant, or extend, metals and other critical materials.

Furniture and fixture manufacturers recently reported employment of 334,000 workers. Wood furniture workers in eight out of ten important manufacturing centers, according to the Bureau of Labor Statistics, increased their earnings this year from 3¢ to 12¢ per hour.

Workers in Los Angeles had an average of 12¢ an hour. Men, who, by area, represented from 81% to 96% of the total employment in the furniture industry, had average earnings ranging from $1.00 an hour in Martinsville, Virginia; Winston-Salem and High Point, North Carolina, to $1.55 in Los Angeles. In seven out of ten areas men had earning levels of at least $1.20 an hour. Women average from 81¢ an hour in North Carolina to $1.43 in Los Angeles.

Office of Small Business of the Department of Commerce recently issued a survey defining small business. It found the term is relative.

Aircraft factories are small business when they employ a maximum of 2500 persons. Aircraft propeller manufacturers are small business when they employ a maximum of 1500 persons. Boat builders, who are small business, employ 100 persons.

Small business in the furniture and fixture industry, have a maximum of 100 employees; house furniture, wood, are small business with 150 employees; office furniture, wood, 150; Venetian blinds, 100; baskets, 100; cigar boxes, 100; mirror and picture frames, 100; millwork plants, 100; plywood plants, 250; general sawmills and planing mills, 100, and practically every other wood product, 100.

Woodworking machinery manufacturers are classified as small with 100 employees; so are broom and brush manufacturers, with 100; lead pencil manufacturers are small with 250; and those who make matches are small business with 400 employees.

Population of the U. S., including the Armed Forces overseas, was 155,107,000 on October 1, 1951.

The new renegotiation act applies to all industrialists who have contracts with the government involving $250,000 per annum, or more. The act applies to defense contracts and subcontracts with the Military Services and fifteen civilian government agencies.

Striking Campaign in

The Saturday Evening POST

continued for 1952 . . . users of Phillips Cross-Recessed-Head Screws reap the benefit

Once again readers of The SATURDAY EVENING POST are being told to look for the clue to quality: Phillips Cross-Recessed-Head Screws. Take advantage of this powerful promotion by assembling your products with these quickly identified fasteners. You save time, work, money because Phillips Screws . . . Wood, Machine, Tapping or "Sems" . . . start faster, eliminate driver skids, damaged parts, split screw heads. What's more, they add structural strength. Be sure to include the clue to quality in your specifications!

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Test a PHILLIPS SCREW
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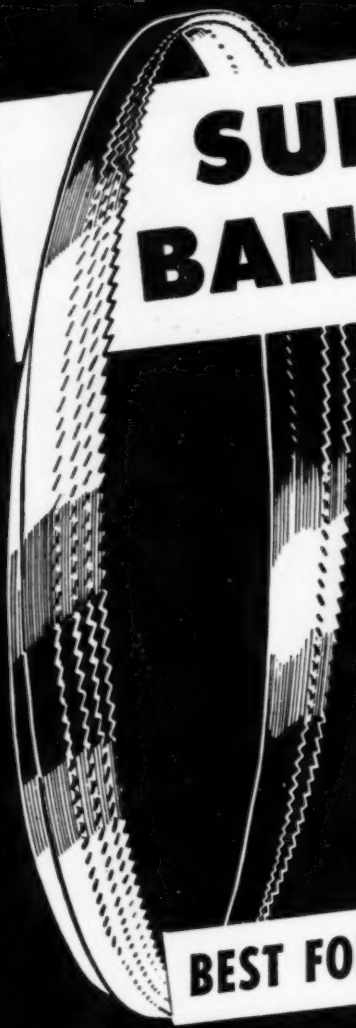
THE FASTENERS OF TODAY . . . AND OF THE FUTURE



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● SUPREME BAND SAWS cut faster...have increased cutting capacity with minimum breakage! Present day high speed equipment demands SUPREME SAWS. Free from kinks and imperfections. Made from the finest Special Nickel Alloy Steels, tempered for toughness... to stay sharp! There is a Supreme Band Saw for every industry... for every material. Special purpose saws are made to order.

BEST FOR EVERY INDUSTRY

The SAW & KNIFE SPECIALTY CO., Inc.

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RESOLUTIONS for 1952

More than any other industry, we in woodworking are fortunate in that we have for our immediate needs an adequate supply of raw materials. With a forward look into not only the coming year but into the years to come, let us all resolve to do our part to protect and increase this raw material supply. There are many ways we can do this, each according to his position in life.

For the traveler, the vacationist, the sportsman and hunter, be sure to put out that match before you toss it on the ground. Put out camp fires.

For the forest owner or leasor and wood lot owner, practice forest management consistently for present and future profit.

For the lumber manufacturer, don't cut carelessly, reduce your waste and intelligently use the waste you do have.

For the wood product manufacturer, use the wood best fitted for the product you make and utilize all the material you possibly can.

For the veneer cutter, investigate the possible use of other species and the new methods of cutting and preserving.

For the plywood fabricator, cooperate with the manufacturers of adhesives and materials such as hardboard with a view to improving their product and increasing its variety of uses.

For the producers of materials and equipment used in the fabrication of plywood; carry on the splendid work you are and have been doing to improve wooden products.

For those who utilize wood waste and shavings, explore additional fields for the use of these products in the building and construction industries.

For all of us, take the present opportunity to win back many of the markets where metal and other materials have replaced wood.

By doing these things you will conserve one of nature's most wonderful gifts to man — WOOD!

Ned Bailey
Editor-in-Chief

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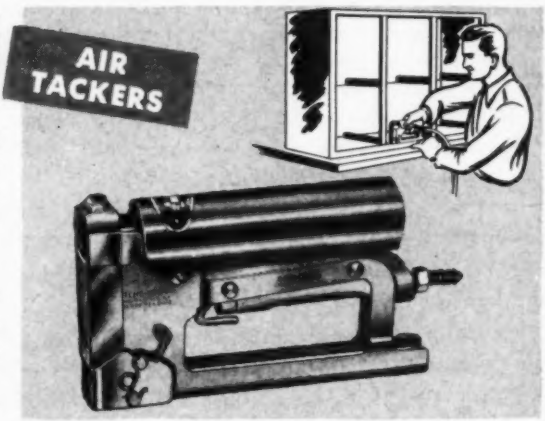

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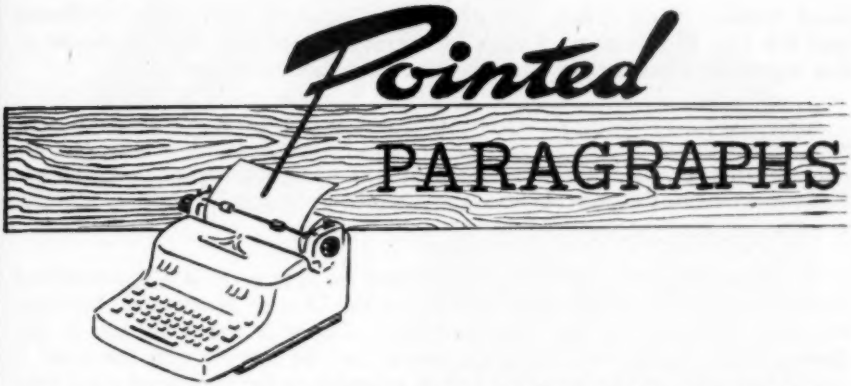

Along the lines of my Christmas editorial in the last issue, the following ad by the Bankers Trust of New York seems quite appropriate. Let us recognize its deep significance.

> *"There is goodwill in the hearts of men at Christmas. There's a warm welcome for the neighbor, a deep desire for friendship between nations, a determination to achieve lasting peace.—Clouds scud along the horizon, sometimes building up to frightening thunderheads.*
>
> *Angry voices thunder without reason, and threats, like lightning, break and crash over the people's heads.—Yet the eternal stars are there, stars of Hope, of Faith, of Love, now dimmed or hidden by the clouds, now breaking through with a clarity, brilliance and strength that will not be denied—May these stars be seen and followed by the wise men of all nations, and may they light the path to peace."*

I have always maintained that we have only started to utilize wood and the by-products of wood. In fact, I believe within the next ten years we will see things made of wood, not in the form of lumber but from veneer, plywood, scraps, shavings and sawdust that will astound the world. Some of these things I have seen in the making, some of them are already here. Wood by-products too, will continue to plan an increasingly important part in our manufacturing and in industry generally.

This outburst of prophecy is brought about by the astounding progress being made in the use of cellular plastic laminated plywood. For example two new products made by, of all types of concerns, the Pressed Steel Car Company of Chicago, namely a freight car and a

truck trailer. Well folks, just keep your eye on that state of Texas and the city of Houston. There is a concern that has homes made of this material already beyond the drawing board stage.

According to the wood barrel manufacturers association there is a real opportunity of saving for other uses 50,000 tons of scarce steel—use wooden barrels instead of metal barrels as shipping containers. The wood barrel group believe they could produce 2.5 million barrels a year for such replacement.

When will the Market attendance limit be reached? We are advised that the advance registration figures for the Winter Market at Chicago, January 7-18 point to the "biggest ever." There is every reason to believe it will, what with retailers stocks at the lowest ebb for over a year. In addition, the manufacturers promise to bring priced right and designed right mechandise. This combination should provide a good market both in attendance and sales.

The Market this January should indicate among other things whether or not blond woods will continue to be top choice or if the growing popularity of an old time favorite American cherry, will take over the number one place in the furniture hit parade.

A la Walter Winchel, figures for '51 furniture sales indicate that our guess made about this time last year and published in WOOD WORKING DIGEST was about right when we thought '51 sales would be about the same in dollars, as '50. To wit: Cumulative orders for the first 10 months of '51 were only 1% less than the same period in '50, with a 6% increase in shipments.

Here we go again, we look for a drop of between 10% and 15% in '52 with government demands on the furniture manufacturers possibly making up for that percentage and possibly more.

A thought for the day: We can rant and rave and cuss the crookedness in politics and elsewhere just so long as we see to it that all our own dealings, large and small, are completely honest and above board.

Have you seen the Douglas fir plywood ads now appearing in national consumer and business magazines? Our hats are off to this two-fisted promotional minded Douglas Fir Plywood Association with their slogan "America's Busiest Building and Industrial Material—Fir Plywood" and "Only plywood has these features—large panel size, light weight, cross laminated strength, attractive appearance, workability, tested quality."

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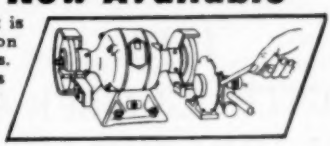
The ORIGINAL Safety Saw Blade tested and approved by the World's leading Laboratories

Woodworking shops all over the country are using and approving the remarkable new PTI Safety Jaw Blade. Provides dependable safety, minimizes danger of "kick-backs" from circular sawing. (U.S. Patent No. 2,559,355.)

Precision made of chrome vanadium steel by one of the world's leading saw blade manufacturers. Cuts cleaner, quieter, smoother—and requires 30% less power. Available in sizes from 7" to 16".

Safety Saw Blade Sharpening Attachments Now Available

Low-cost grinding attachment is now available for precision sharpening of PTI Safety Blades. Write for full details and prices on PTI blades and sharpening attachment.



Write for Circular and Dealer Prices

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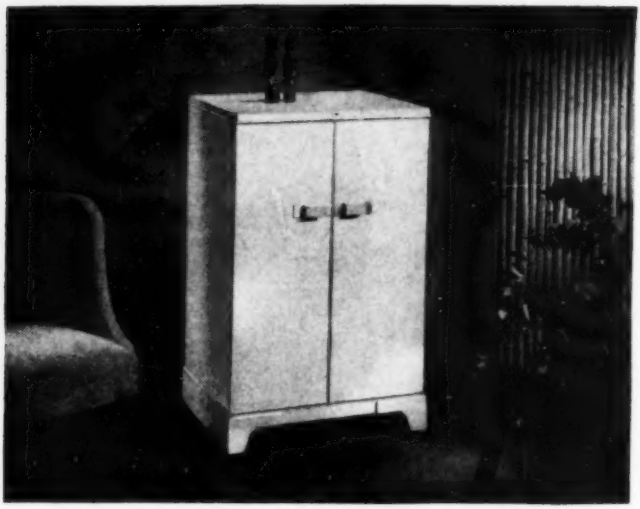
Where does ATLANTIC LUMBER go?



Philco model 1834-5
Television cabinet in blonde oak.

The startling beauty of this modern cabinet makes it stand out in any setting. Whether you use Atlantic Lumber to create a beautiful cabinet, a comfortable chair, or any other long-lasting product . . . you get greatest value by combining fine design, the right hardwood, and superior craftsmanship.

Your Atlantic man knows your hardwood problems. Often he can help you. Ask and follow his advice.

THE ATLANTIC LUMBER CO.

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Headquarters FOR HARDWOODS

IS *Bending*

of SOLID WOOD Becoming a Lost Art ?

Part 3

BY PAUL H. GRAHAM

THE properties chiefly affected by any softening process are probably best described in a report by the late T. R. C. Wilson, former member of the U. S. Forest Products Laboratory, who was most active in the field of wood bending. In a paper on wood bending delivered at a meeting of the A.S.M.E. Wood Industries Division, he stated: "In general when a piece of wood is bent in the form of an arc, the outer fibers are under tension and the inner fibers are under compression. Also, during bending rupture of the wood may involve shearing failure."

These are the basic mechanical principles involved during wood bending. Bending may be generally classified into free bending without straps or end pressure, and supported bending with straps and controlled end pressure. The bending operation itself falls into two classifications also: bending on unheated forms and bending in heated presses. The choice in the first classification is dependent upon the wood species, dimension, moisture content and degree of the bend. The choice in the second classification is usually dependent upon the nature of the bent parts and the facilities readily available.

The quantity to be bent is the chief governing factor in a choice between hand and machine bending, although machine bending still has such limitations as to require hand bending of some parts even in quantity lots.

It is possible to lengthen or stretch wood very little without tearing apart or tension failure but it can be shortened, compressed or upset much more. In wood bending, therefore, the prime object is to stretch as little of the wood on the convex side of the bend as possible but bring about almost all the difference in length between the convex and concave sides by compressing or upsetting. The upset should be uniformly distributed along the length or bent portion of a stick and is considered at maximum at the concave face, decreasing uniformly to zero at or near the opposite or convex side.

Wood in any condition is always much stronger in tension than in compression but the tensile strength of the wood alone is not sufficient to allow bending without tension failure unless metal straps with metal fittings are used to take up a greater portion of the tensile force required to balance the compressive force which must be applied to produce the necessary shortening or upset. This force is very great and at times even the bending straps with end fittings are not capable of resisting this force.

There are as many divergent opinions on proper bending technique as there are plants doing wood bending. The

Courtesy, Woodworking Precision Machinery & Tool Co.

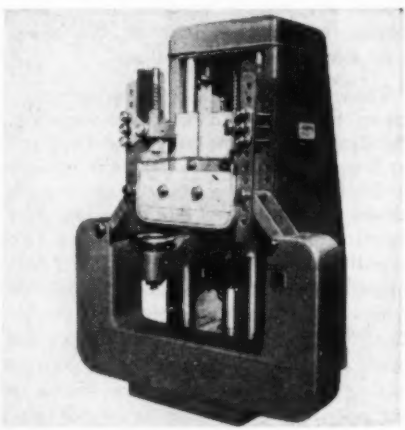
Bendiko Swiss precision bending machine handles work up to 2½ inches thick, 8 inches wide and 5 feet long without special attachments and longer bends are possible with special clamping devices. This is a motor-driven vertical double arm straight bender which uses a stationary bending form to shape the bend. Time said to be required to complete one bending operation is 40 seconds.

point of greatest dispute is probably the need for and means of producing and maintaining end pressure. Some plants make all mild bends without straps or other means of end pressure, while others use end pressure for all bends. In making acute or severe bends some apply a definite amount of end pressure by means of hydraulic cylinders, reversed levers, or some other mechanical means; others depend upon the resilient properties of side grain wood blocks or wedges.

Very few wood benders will agree on the proper method for softening bending stock or the period of time involved. Most of them in actual practice disregard the time element completely and depend upon a manual bending test to determine the proper degree of softness. Nor will they agree as to when conditioned stock should be bent. Some insist the stock should be bent hot as soon as possible after it has been removed from the steam retort; others purposely permit the stock to cool and dry somewhat before bending.

The speed with which bends should be made is also a moot question. In hand bending this is usually done by feel, a sense that is acutely developed in some of the older wood benders who can seem to feel just what portion of a bending stick must be favored in bending to prevent breakage. In machine bending the speed at which pressure is applied is usually determined by observation of the bending stock as the bending progresses.

Thin stock can be spring bent without steaming where it can be fastened to other members of a wood structure, as in a groove. Thin strips for basket and bucket hoops are bent free without steaming and are fastened together at the ends to maintain their bend. Small parts with mild bends are bent between heated plates of a bending



Completion of bend in Bendiko precision bender. When both ends have been forced against the top of the stationary bending form, they are anchored by means of a tie-rod placed in anchorage points provided in the strap to permit removal of the bent work from the machine.

Reverse bends are made on special forms with straps affixed to center block of metal form so the strap bears against the outside of the bend as the stock is bent in opposite directions.

press without steaming, such as chair backs, but these have a tendency to straighten out somewhat during machining and use. Chair slates are also bent by this method as they are inserted into grooves in the back posts where they are held in shape by the completed chair assembly.

On more acute bends metal straps or pans are used, equipped with end pressure devices, for use in either hand, machine or hot press bending. In some cases both end and side pressure is applied to prevent tension failure. In press bending the reversed lever process is often used, in which end pressure is applied to bending stock before actual bending begins and is released gradually as the bending progresses. Side pressure is applied also in other devices by side screws to prevent the end pressure from twisting the stock as it is being bent.

Bending lever and pressure end fitting should be perfectly rigid. "U" stock is often used for these and the device is so constructed that it contacts the piece being bent closely on all sides except the side next to the form. Stationary end fittings are not too well adapted to severe bends as considerable adjustement is necessary to compensate for upset. This is usually provided for by means of end pressure plates mounted to pivot clamp fashion at the ends of screws threaded through the end fittings.

Even though machine bending has replaced many hand bending operations, complex and severe bends are still best made by hand. Compound bends are strictly hand bends requiring as many as three men working together as a highly-coordinated team. This type of bending requires the favoring of the stock around the acute portions of the bend and the benders must depend upon observation and feel to determine the speed and pressure with which the bend may be made.

A good bender develops an acute sense of feel of the reaction of the stock in bending. The use of too strong or rapid a pull, or jerking, will usually result in breakage. Complicated bends bring into play arm, shoulder and

Deep bending hot plate press developed for captain's chair backs by McKnight Machinery Company. This is a hydraulic press heated by steam hose connections not shown here.

leg action. An experienced bending team seem to develop a keen sense of rhythm and timing, supplementing each other's motion as they act as one man to bend with uniform, even pressure.

Forms used for bending range all the way from crude glued-up wooden forms to smoothly machined metal forms accurately designed and constructed to produce the shape required by the finished part. The metal form, usually cast iron, is generally preferred and is constructed with its inside contour shaped to the outline of the bend and to a height slightly more than the thickness of the stock to permit the application of anchoring or intermediate bending hooks or lugs used to secure the strap-enclosed stock in its bent shape. The bottom of the form is perfectly flat, flowing out from the inside flange to provide an L-shaped cross section and wide enough to accommodate the width of the bending stock and strap and the overhang of the bending hook or lug. One or more cross members are usually provided to supply added strength and rigidity to the form.

Where the plane of the bend is in more than one direction, the form is provided with curved legs to govern the bend but the inside wall here is just high enough to contain the stock and still permit the bending hook to be applied over top and bottom rather than from the side. Specially-designed hooks or lugs are provided which slip on from the side or slide over the form and stock to completely enclose it. Wooden wedges are used to tighten the stock against the side and bottom. A special combination bending strap is also used here, usually made up of two strap lengths connected and arranged to cover all bent parts of the length of the wood regardless of the plane of bending.

Wooden frames are usually mounted on a base panel to keep the stock in an even plane while bending and have holes bored near the ends and at the mid-length of the bent section to receive the metal bending hooks used to secure the stock on the form. Some provide additional holes to keep the stock in close contact with the edge of the form in irregular curve bends.

The chief advantages of the metal form are that it has no tendency to change shape when heated to dry and set the bend, can be heated prior to use in bending—a practice claimed to minimize buckling on the inner surface of the bend, and permits easier intermediate clamping as required to bring bulging portions of the bend into close contact with the form. These forms should be painted with a suitable metal paint, such as aluminum paint, or galvanized to prevent staining the wood in bending.

Most plants prefer to use brass or copper straps for the same reason or use stainless steel straps. Others use mild or spring steel straps of 18 gauge for bending stock up to one inch thickness and 14 gauge for greater thicknesses. Where the strap is not stainless steel, a thin strip of non-corrosive metal, such as aluminum, brass or copper, is used between the strap and the wood. This serves to cut down the cost somewhat but does present somewhat of a nuisance factor.

All bending straps are provided with metal end fittings to contain the ends of the stock and the width of the strap is such that the full width of the stock is covered throughout the bend to prevent tension failure. The end fitting is usually of channel section, tapered at the sides from the end down to the strap, to support the stock on all sides except that next to the form. Some means of taking up and releasing end pressure is usually provided so that localized crushing will not occur.

Where the bend is not too severe,

many benders use wood blocks of varying thicknesses cut so that the side grain will receive the end pressure to provide a certain amount of "give" or cushion. Others use wooden wedges cut at rather acute angles between the end stops and the end of the wood to tighten up the strap at the beginning of the bend, working them loose or entirely out of the strap as the bend is made. The angle of these wedges is important as too obtuse an angle will result in uneven distribution of end pressure and failure on the concave face is the usual result.

The best strap fitting for severe bends is the adjustable end stop, particularly when bending stock of small section in comparison to length in which case there is always a tendency of the stock to bend away from the strap. Adjustable end stops permit pressures along the length of the stock to be controlled during bending by manipulation of hand wheels. End pressure must be controlled throughout the bending operation so that it is not too little at the beginning of the bend or too much as the bend progresses.

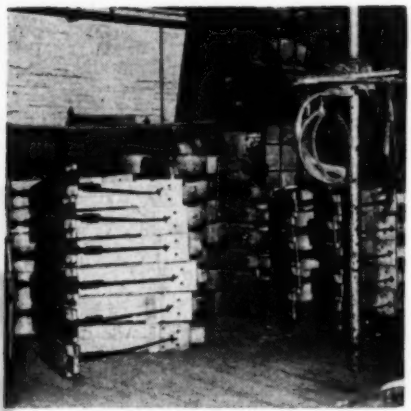
Curved chair backs are glued up with stock previously bent in the hot plate press widthwise instead of the usual longitudinal bend.

Circle bending chair and stool rims by hand with special hand lever for better leverage.

The usual operation sequence of hand bending involves placing the form on the work table so that it remains stationary during bending, removing the stock from the steam retort and placing it within the strap. The loaded strap is then located and secured at its midsection on the center of the form; then the two halves are bent evenly around the form and secured at their ends to the form by bending hooks or lugs. If the bend is irregular in form intermediate hooks may have to be applied at more acute parts of the bend. End pressure must of course be controlled at all times.

Where bends are to be made in more than one plane, intermediate clamps are required to keep the wood within the limits of the strap and to prevent back bending. Many intermediate clamps are used to temporarily contain portions of the bend. Experienced benders know just where these clamps should be applied and when it is safe to remove them.

When reverse bends are made in the same plane, the intersection is shaped by the form and a bearing block shaped to the required contour is tightened against the central portion of the stock.



Bent work is stacked from straight press bending machine preparatory to removal to drying room to dry and set bends. Steam retort against the wall is used to condition stock for bending.

Each end is then bent with the stock supported by straps affixed to the block at one end and the form proper at the other, bending them in opposite directions at the same time and securing the ends to the opposite flanges of the form. This type of bend is sometimes made with two long straps on either side of the piece to be bent. This arrangement is rather clumsy to handle and is not as popular where a number of these parts are to be bent.

Machine bending may properly be considered to include hot press bending but will be considered here to treat only that type of bending done, on machines designed to replace hand bending for ease of operation or quantity production reasons. Most of these machines employ a master strap which is nothing more than an over-sized bending strap used to contain and control the stock in bending by applying a compressive force to the ends during bending.

Bending machines have progressed a long way from the first crude wooden machines where the operator had to hold the form to the work by lever, pulling on it as a chain pulled the wood around it to be bent into shape. They still operate with the same basic principle of using a master strap and the use of leverage to force the stock into a bend and against a bending form.

Most bending machines fall into such standard type classification as arm benders (single and double arm), rotary block benders, rim benders, and straight press benders which are variously operated by electric, hydraulic and compressed air power.

The double arm bending machines are commonly used to make 180 degree bends and modifications of U-bends while single arm benders are used for those bends that come within the degree range of a quadrant. They usually employ a stationary bending form to shape the work which is pulled up around the form by bending arms and master straps actuated by lifting chains that are powered by a friction-driver chain drum.

Single arm benders have been designed to bend parts which incorporate a straight section connected with an abrupt bend on one end, like hockey sticks, cultivator, plow and spade handles. These machines usually carry a single bending arm, equipped with a follower supported by a pair of rolls and attached to the machine table by linkage. A toggle motion raises the table with the bending stock to contact the form. The rolls contact the follower with the stock and force its end upward against the form to make the bend which is secured with a bending hook.

Material of heavy cross section is usually bent at the rotary block bending machine which mounts a permanent block in its center upon which metal forms for the various bends are placed. The part to be bent is enclosed

Furniture Corporation

INTER-OFFICE MEMO

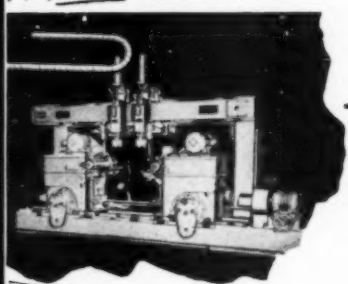
TO: The President
FROM: The Production Mgr.
RE: Bell No. 200 Dovetailer

Dovetails both ends at one time

Dovetails both sides, both ends at one time. Brands trade mark at the same time.

This machine will do our whole line — serpentine, half swell, concave and straight fronts. We can use it as a plain vertical boring machine, too!

Bores hardware holes while dovetailing both ends.



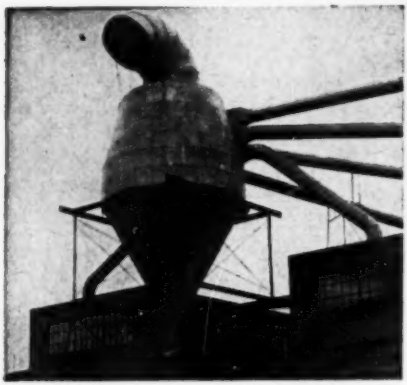
← This is the machine. Let's go see one this week.

Jim

BELL WOODWORKING MACHINERY

The Bell Machine Company
71 Jackson Drive
OSHKOSH, WIS.

Dust Problems Vanish Into CLEAN Air



Large cyclone collector is part of Dixie installation at Ox Fiber Brush Co., at Frederick, Maryland

Efficient dust control means greater output for less cost in any plant where industrial dust is a problem. Thousands of woodworking plants big and small are today benefiting from tailor-made dust removal systems designed and installed by Dixie. If you have a dust problem, consult a Dixie engineer for expert direction. . . . There's no obligation.

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MANUFACTURING CO., INC.

1311 RUSSELL ST. BALTIMORE 30, MD.

Homemade straight press bending machines are used for bending in this wood bending plant. Operator has just locked form with tie-rod and is removing bent stock.

in a bending strap and stood on edge against the form and one is secured with a bending hook. The other end of the stock extends out at a tangent before the bending motion begins. Rollers or other pressure devices in radial slideways are mounted in fixed position around the table so that when the block revolves the stock is forced in against the bending form until the other end can be hooked to the form and the form is removed. This type of machine is usually motor-driven with positive controls, but some of the older machines still in use are belt-driven with an idler and brake arrangement.

The End

We are told that an American citizen needs three eyes today—one for Korea, one for Europe and one to watch Washington spenders.

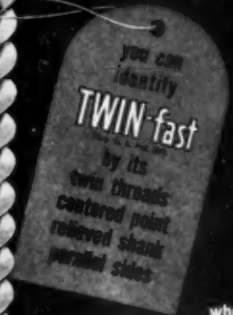
Today destiny is knocking at our door; knocking loudly with hammer and sickle. **—Chief Justice Vinson**

The Double Thread Cuts the Time in Half!

Can be furnished with either Slotted or Phillips recessed head

Save assembly time . . . . . get better fastenings with the TWIN-fast Screw's four exclusive advantages

1. Twin thread doubles the pitch . . . drives the screw twice as far for each turn of the driver.
2. Centered point helps make fast, straight start—no wobbling of screw, no displacement of parts.
3. Relieved shank eliminates "wedge action" and splitting—makes stronger fastening.
4. Parallel sides (no taper except at point) gives greater contact—often allows fewer or smaller screws.



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save DRILLING
save SCREWS
save REJECTS

when assembling wood to wood, plastic to wood or metal to wood

TWIN-fast

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Blake & Johnson Company, Waterville 48, Conn.
Central Screw Company, Chicago, Illinois, and Keene, New Hampshire
Continental Screw Company, New Bedford, Mass.
National Screw & Mfg. Co., Cleveland, Ohio, and Los Angeles, Calif.
Stronghold Pacific Corp., Downey (Los Angeles), Calif.
Stronghold Screw Products, Inc., Chicago, Ill.
Southington Hardware Mfg. Co., Southington, Conn.
Townsend Company, Brighton, Penna.

Please send copy of the new TWIN-fast bulletin.

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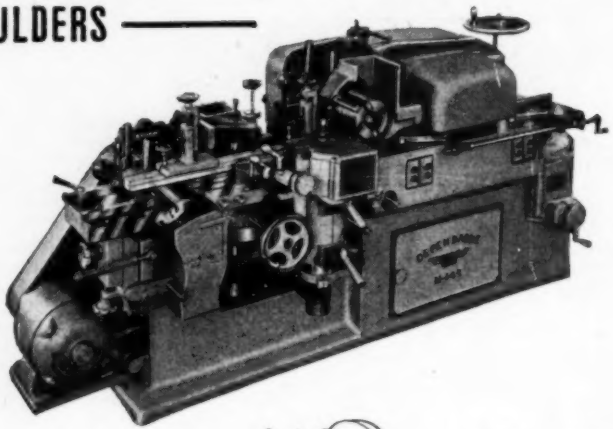
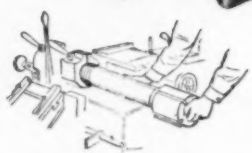
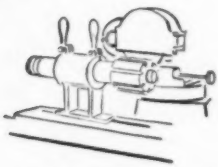
City ..... Zone ..... State .....

NEW! DEPENDABLE'S ELECTRO-UNIT DRIVE MOULDERS

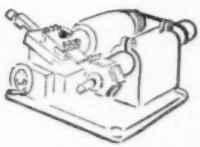




Quick, easy removal of Cartridge Spindle Unit



Head being ground on Cartridge Spindle Unit



Head being jointed on Cartridge Spindle Unit

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How to do ★★★ BUSINESS with the Government

By H. E. Holman

SINCE the beginning of the defense program, sellers and producers of goods have been seeking the various means of securing contracts and subcontracts from the government procurement offices. On numerous occasions, industry representatives have come to Washington apparently with the feeling that it was necessary to discover some mysterious procedure and that only through proper Washington contacts, could they be successful in securing a contract to furnish material to the defense program. A trip to Washington is by no means a prerequisite to doing business with the government procurement officer. The fact of the matter is, most of the procurement offices are located in various parts of the United States and in many instances a long way removed from Washington where they are susceptible to more intimate and personal contact by the potential producer and seller.

I have been asked to devote my attention to the subject of how to procure government contracts subcontracts. The subject is of such extensive nature and made up of so many important elements that it could be justified as a subject to be included in a college course in business administration and would demand a five hour credit for an entire semester in any university.

I do not, by any means, wish to convey the impression that it is extremely difficult to do business with the U. S. government procurement officers. On the contrary the government procurement officers are extremely desirous of placing government business where the maximum benefit will accrue to the civilian economy but at the same time procurement must be consistent with established criteria. The U. S. government is by far the largest purchaser and consumer of goods in the entire world. Its purchasing power is a tremendous factor in sustaining production which in turn provides employment which translates into further purchasing power. Because of the tremendous number and kinds of articles purchased and the multiplicity of procurement agencies, certain criteria must be established that must be observed rather uniformly by the various purchasing agencies. The money that is being spent for the purchase of goods is public funds appropriated by the Congress of the United States and comes out of the taxpayers pocket. Therefore, there must be established a strict accounting procedure, not only in terms of money expended but in terms of the articles purchased, the usability of those articles in meeting actual need and the relative price that is paid for them. Since the funds are

Mr. Holman is Assistant Director, Lumber & Wood Products Division, NPA, Washington, D.C.

public funds coming out of taxpayers' pockets, every taxpayer has a right to participate in the furnishing of requirements. Since theoretically, every procurement office is responsible to the taxpayer, it is necessary that a strict set of rules be applied and uniformly followed. These rules must be adhered to by the taxpayer as well as by the procurement officer. The procurement officer is in the final analysis accountable to the General Accounting Office and if there has been a laxity or even a justifiable error made in the matter of procurement, adjustments have to be made and in some instances these adjustments might affect even the taxpayer who has sold the goods.

I have heard on numerous occasions, bitter complaints not only by corporation executives but individuals regarding the red tape involved in attempting to do business with the U. S. government. In the case of government activity, it is termed red tape but any company, large or small, who is purchasing and consuming goods, must adhere to some kind of a business policy to guide them in the purchase and consumption of goods. It makes no difference whether the purchases are small or large; there is always the matter of payment involved and the quality and usability of the articles, delivery schedules and arrangements made for adjustment for failure to adequately meet the sales contract. In almost every instance, where complaints have been made to me, I have discovered that the ones complaining were not willing to meet the established criteria or were disgruntled because a substantial modification could not or would not be made to fit the peculiarities of an individual or corporation.

I have also observed that there is something of a feeling on the part of a substantial segment of industry that all they have to do if they want to sell products to the government is to apply for a government contract. I assure you that anyone desiring to do business with the procurement officers of the U. S. government are entering a rather competitive field and there is a substantial amount of salesmanship required in order to direct the attention of the procurement officers to your particular plant.

It is not the duty nor the responsibility of the procurement agent to carry on an extensive correspondence or make personal investigations of your plant in order to be convinced of your ability to perform. It is your responsibility to convince the procurement officer that you are a reliable source for furnishing special requirements. He is your potential customer and he is entitled to the same treatment and the same consideration that you are giving other customers. The situation insofar as lumber and wood products is concerned is yet a buyers market and the selling competition is keen. If there was a shortage, the procurement officer would naturally be seeking additional sources of supply but since this is not the case, the seller must seek out the procurement officer and do a selling job.

There are so many people desirous of doing business with our various procurement officers that it is not necessary to spend the extra time and have the additional expense to seek out and find additional sources of supply. Therefore, the question comes down to this—are you sufficiently desirous to do business with the U. S. government that you are willing to put forth the necessary effort to get the business? If you are, then the only problem you are facing is to ascertain or familiarize yourself with the procedures and the criteria you must follow.

My experience in industry has made me very conscious that probably one of the most important phases of a suc-

cessful operation is to have a reliable sales program. I was never fortunate enough to be connected with an organization where we were able to build a sufficiently attractive mousetrap so that the public beat a path to our door. Production was maintained as a result of a satisfactory market and this market was only retained as a result of an active sales program. I have not been able to observe that it is necessary to make substantial changes in an established sales program in order to do business with the U. S. government. In general, any sales program must provide a means for acquainting the potential buyer with all the pertinent facts pertaining to the article or articles that the producer is able to furnish. These, I think, can be covered by quality, price and service, the financial stability and the integrity of the producer and the seller and the acceptability or the usability of the articles to meet an existing need.

The procedures established for bringing these elements to the attention of the buyer varies somewhat when the sales work is being directed towards the procurement officer for the reason, as pointed out above, that the procurement officer must have documented evidence in his files so he can have current evidence in justifying his action as well as evidence that can be retained in the files for a considerable length of time. Certainly the first act of the supplier should be that of getting acquainted as soon as possible with the prospective buyer in the procurement offices and to get formally registered as a potential supplier. This can be done either by personal contact or through correspondence. The buyer should be supplied with a written statement of what can be produced and the kind of article that can be manufactured, the quantity, financial status of the company and if possible and wherever possible, provide samples of the products and statements from reliable sources regarding reliability and ability to perform.

Whenever it is deemed you are a legitimate supplier of needed articles, you will be invited to bid. However, in most cases, the policy has been established that after three invitations to bid have been ignored, no further invitations will be sent you. Your name will be removed from the bidders list. However, if the recipient of the invitation simply acknowledges the receipt of the invitation and provides a legitimate excuse as to why bids could not be submitted and requesting that your name be maintained on the list, you will then continue to receive additional invitations.

Some instances have come to my attention where a company or an individual has not bid because the amount required on the bid was out of proportion with the sellers ability to supply. I am advised that in almost every instance that procurement officers will accept bids on all or any part of the material required.

Certain formalities have been established to provide the procurement officers with the above information but there are a number of instances where the prospective seller has accomplished the desired results through personal contact and through correspondence.

In the National Production Authority of the Department of Commerce there is established the Office of Small Business. This organization is very conscious of their responsibilities. They have established and maintained a very fine liaison with the various procurement agencies serving the U. S. government. They have done a fine job of collecting and compiling the rules and acquainting the public in general with the procedures and criteria that must be followed. The Office of Small Busi-

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A TOOL ROOM
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Use our double bearing guide bars for flat bottom mortises. The riveted plate and bearing construction provides the utmost in strength and interchangeability. More than 90 standard sizes in the FIELD line of cutting equipment. We are well-equipped to furnish special sizes like the above bar in many widths and lengths.

Write for complete information on our chain mortising equipment.

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WOODWORKING MACHINERY DEPOT

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ness is not staffed to direct special emphasis towards one particular segment of our national industrial family except where that segment might be directly responsible for the production of articles that are in extreme short supply to meet our defense program. In other words, it would hardly be feasible for the Office of Small Business to put on a program expressly designed to assist the millwork manufacturers but they are vitally concerned with the millwork manufacturers problems and have provided the general procedures and general criteria.

The Lumber & Wood Products Division have the responsibility of assisting all the segments that make up the Lumber & Wood Products Industries and it is our responsibility to maintain a close liaison with the Office of Small Business so that we may keep our area of responsibility completely familiar with the rules as they apply to our industries.

In order for you who desire to do business with the U. S. Government to become more familiar with the formal procedures, I would suggest that you secure the document entitled: "Munitions Board Manual No. 90-1, Production Allocation Manual." This document presents to the prospective seller the program for production planning for emergency procurement and the administrative and operational procedures that have been established.

The Office of Small Business have available publications known as "Military Purchasing Offices," "Major Civilian Government Purchasing Offices." For example: one of the military purchasing offices is located in Boston; address: Supply Office, Boston Shipyards, Boston 29, Mass. There are also others. One of the civilian government purchasing offices is located at the General Service Administration, Room 620, Post Office and Court House,

Saddles or scoops any shape or size of chair seat.

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AUTOMATIC SADDLE SEAT MACHINE

SIX TO TEN SEATS PER MINUTE

CONTINUOUS PRODUCTION HOPPER FEED

The McKnight No. 1-E Saddle Seat Machine cuts six, eight or ten seats per minute. It is the highest speed and most efficient saddle seat machine manufactured. Stock is carried from the hopper to the cutting head by a steel chain. Motor, 10 HP, 3600 R.P.M., ball bearing type. Cutting Head runs at 5000 R.P.M., is mounted in ball bearings. *Write for further details.*

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ONE machine files cross-cut circular saws, band saws, hand saws.

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MINNEAPOLIS 18, MINN.

Please send literature, and details of your 30-DAY TRIAL OFFER.

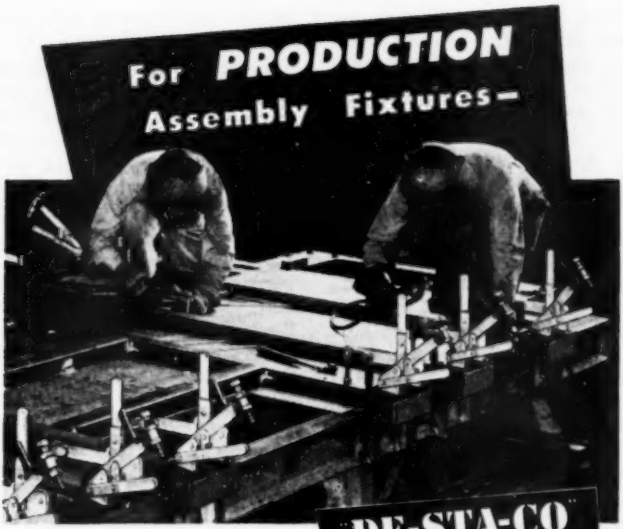
Name .....

Address .....

Boston 9, Mass. I have already referred to Munitions Board Publication, Production Allocation Manual and I would suggest that you who are interested, write to the Superintendent of Documents and obtain the following: How to sell to the U. S. Army—Price 30¢; Purchased items and purchasing locations of the Dept. of Navy—Price 20¢; A guide for selling to the U. S. Air Force—Price 15¢. Incidentally, do not send stamps.

Those of you who are interested in subcontracting work may wish to write to the office of Naval Material, Department of Navy, Washington 25, D. C. for their publication: "Subcontractor opportunities with Navy contractors." You will find that this publication contains a wealth of information. Through the Office of Small Business you can obtain a copy of: "How to sell to the Government" and "Subcontracting pointers for small plants." Obviously it is always helpful to know what products are being bought and who's buying them. The U. S. Department of Commerce is currently publishing two very valuable documents that will answer these questions. One is called "The Daily Synopsis of Procurement." This publication lists the procurement agency, its location, the quantity and kind of article to be bought, the date the invitations or proposal will be submitted and the opening date of the bids. It would be absolutely and physically impossible to distribute this document to all segments of the industry throughout the United States on a daily basis. They are available however at our field offices, in the office of most of the chambers of commerce throughout the country and in the office of the chairman of the governor's committee in each state where these commissions have been established to aid small business.

The companion publication to the



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High holding pressures and precision construction of "De-Sta-Co" Toggle Clamps make this assembly fixture efficient. Locating pins welded to clamp bars *locate* channels for welding assemblies of varying lengths. Positive holding pressures, up to 4000 pounds in some models, hold parts in close contact essential for good production welding. *The same principles apply* to your drilling, machining, bonding, gluing or other production processes. Quick toggle action permits fast, safe loading and unloading of fixtures, uniform results, even by untrained workers.

Your nearby "De-Sta-Co" Distributor stocks more than 40 models for your convenience. Write for his name and your copy of new catalog issue.

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"Daily Synopsis" is entitled the "Weekly Synopsis." This publishes weekly what has been bought, the quantity, the dollar value and the contractor and his address.

By referring to this publication one can ascertain who has been the successful bidder or the prime contractor. The prime contractor may desire to subcontract some of the components and anyone in a position and desirous of subcontracting can, by referring to this list, get all the pertinent information. If I were in any way concerned with a plant desirous of having some subcontracts, I would make this document my constant reference book. For example, there is an item of 232,248 brushes with 17 inch handles. A person in a position to make handles, desiring to participate in this business, should contact G. C. Green, Mfg. Corp., War-

ren, Pa. Every other item listed on this document is going to require shipping material in some form. Every contractor listed is a potential purchaser for shipping containers and shipping lumber and I would give careful consideration to those companies who seem to be in an advantageous shipping zone. zone.

I mentioned a moment ago the governor's committee for aid to small business. The governors of 33 states have already appointed these commissions and each of these 33 governors have appointed a chairman of each committee. These committees are charged with the responsibility of cooperating with the defense administration in marshalling community resources to aid small business. The military procurement officers have been requested by the chairman of the munitions board to maintain a close liaison with the governor's committee so that military procurement can be used as a means of maintaining industrial activity.

I want, if possible, to dispel the idea that it is necessary for the potential seller to make and maintain contact with the Washington office of any agency engaged in the procurement of goods. I have referred previously to a published list of procurement offices scattered rather generously over the entire United States. These procurement offices have been established primarily for the purpose of decentralizing the procurement activities of the U.S. government and to make it possible for the producer and seller of goods to become intimately acquainted with not only the personnel but the established procedures of procurement. In other words they have been established primarily for the convenience of the public desirous of doing business with the U.S. government.

In many of these procurement of-

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For over fifty years, Gamble Brothers' wood-engineering "know-how" has successfully solved production problems for manufacturers of fine mahogany furniture and other hardwood products. Let Gamble Brothers' knowledge and skill help you.

WRITE TODAY!

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Engineered Wood Parts in Southern and Appalachian Hardwoods, Walnut or Mahogany

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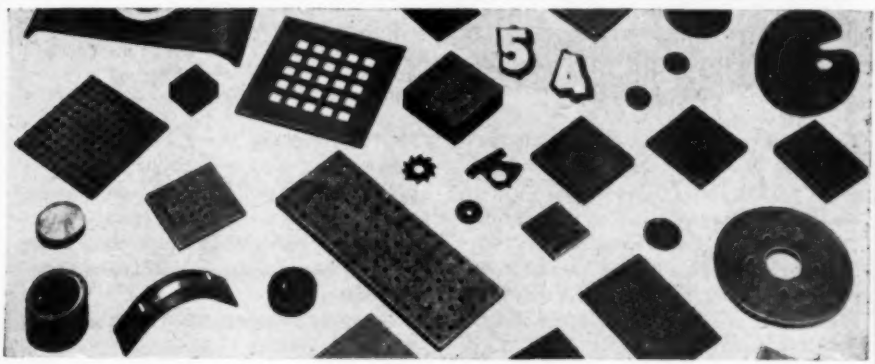
fices there have been employed specialists whose services are available to that segment of the public who desire to produce and sell goods into the various defense and government civilian programs. The Department of Commerce have established field offices in most of the major regions of the United States. Here in Boston we have a field office located at 40 Broad St. These offices are staffed with specialists who are not only familiar with the problems of the Lumber & Wood Products industries but also specialists who are interested in helping industry secure contracts or subcontracts and make it easier for people to do business with the government.

There is a plan afoot to establish clinics in the major cities of the United States where detailed information will be disseminated and when these clinics have been formally established, I would suggest that anyone desiring to secure contracts or subcontracts with the U.S. government, make it a point to have some of their representatives attend.

In closing, may I further emphasize the fact that everyone has an equal opportunity to do business with the various procurement offices providing they can meet established procedures but it is necessary for the seller to convince the procurement officer that the seller possesses the ability to meet competitive prices with quality merchandise and give satisfactory service. Further, it is the responsibility of the seller to recognize the government procurement officer as another potential customer and apply pretty much the same sales techniques in securing government business as in securing business from civilian customers.

Nature is wise: in devising a mortal's hinges she knew he would have little occasion to pat himself on the back.



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. . . Greenlee No. 110 Six-Roll Single Planer

The minute you run a piece of stock through a GREENLEE No. 110, you'll see what we mean when we talk about "smoothness". Finely finished panels can be planed so smoothly that they require little or no sanding.

Yet the No. 110 is a production machine for all types of planing. Feed speeds for rough cuts as well as for finely finished work are available. The entire operation is performed with such ease and speed . . . the finished work comes out with such fine finish and accuracy . . . you'll be able to picture immediately the extra production this GREENLEE equipment can bring to your plant.

Friction, wear, and power consumption are reduced to an absolute minimum by means of ball and roller bearings, and oil-tight housings for the gears, which keep out dust and dirt. Bearings are lubricated by high-pressure grease gun, and the enclosed gears run in oil and lubricate themselves.

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GREENLEE WOODWORKING MACHINERY: MORTISERS • BORERS • SAWS • TENONERS • PLANERS • SHAPERS • MORTISING and BORING TOOLS

HARDBOARD may be the ANSWER

By Robert Charles

Hardboard is included as one of the projects in "A Review of Forest Products Research That Paid Off," by Armin Elmendorf and published by the Forest Products Research Society. Mr. Elmendorf is president of the Elmendorf Research Corporation of Chicago.

He outlines the problem as it existed 30 years ago by saying: "The problem in 1920 was to produce a high density synthetic board much wider than ordinary lumber, out of timber that is not suitable for conversion into lumber. Harder than wood, isotropic in its properties, and which will shrink and expand much less and be stronger than wood across the grain." It *should*, he continued be able to take all high grade finishes normally applied to wood surfaces and lend itself to gluing so that veneers and other surfacing materials may be bonded to it. Other requisites include: must be easily sawed and receive nails without splitting.

Thirty one years later the problem seems to be pretty well solved. Mr. Elmendorf tells us that 12 plants in the United States and Canada are manufacturing hardboard. One of these manufacturers produces as much hardboard daily in footage as the combined footage of lumber produced by the two largest sawmill operations in the world.

— The Editor.

HARDBOARD, though introduced in this country only 35 years ago, has more end uses than some other building materials.

It is possible in our generation to be placed in a hardboard cradle the day we are born; then, as we grow up, to play with hardboard toys; store our clothes in dressers with hardboard bottoms; listen to radio and television sets with cabinets partially or wholly made of hardboard, while sitting on chairs or divans that have hardboard backs, as we play cards on a hardboard table top. We may walk on linoleum with hardboard underlayment. Even our cars, trucks, or trailers may contain hardboard parts.

But this is only a small beginning of hardboard uses today. (See accompanying table.)

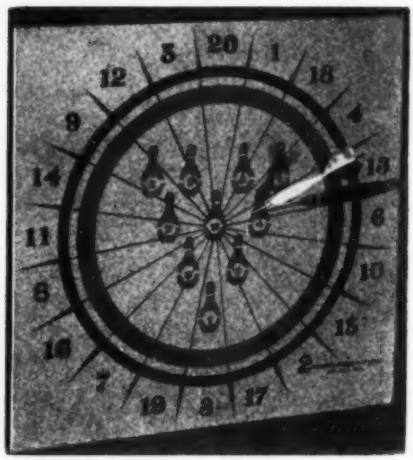
For example, because of the high dimensional stability of some boards, many of our precision-built products such as laboratory, appliance and other equipment, are made of hardboard. During World War II, the War Production Board alone listed more than 300 uses where hardboard could be substituted for metal. During the present defense era, this list is expanding. The advantages of hardboard have led many industrial firms to change their entire method of operation on occasion to permit them to use hardboards in their work. There are eleven major industry groups ranging from tileboard

Floor of baby play pen is made from hardboard.

manufacturers to toy and novelty firms which use hardboard as an essential or secondary part of their products.

The significant characteristics of hardboard, besides low cost, include easy workability, great strength, durability, dimensional stability, and (some products like Duron) smoothness on both sides for easy, beautifully smooth decoration. Hardboards have been bent, die cut, scored, laminated, shaped, routed, sawed and processed in almost every desired way, permitting incorporation into many products that would be prohibitive in price if made with conventional materials.

Small wonder that hardboard has come well into its own, and has made a significant and permanent entrance into the wood industry. It is a first-rate material, recognized as such through its own performance record.



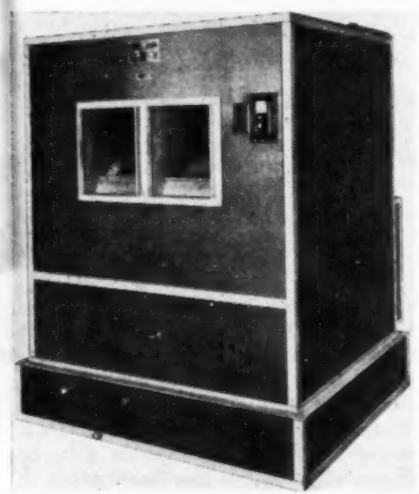
Gameboards of all sorts and sizes can be manufactured from the material.

Why this rapid growth in hardboard popularity?

The answer has been in most cases, why pay more for other products that do less?

To understand more of the construction and characteristics of hardboard, we shall describe the methods by which one manufacturer makes hardboard.

The United States Gypsum Company's method begins at the company's Greenville plant in Greenville, Miss. Small logs of the type not normally used in the lumber industry, supply the basic parts for hardboard. Very little of the log is wasted, as it is ground into fine fibers, mixed with special



An industrial application of hardboard is seen in this Coolerator.

A PARTIAL LIST OF HARDBOARD USES

Automotive
Sun visor and bracket assemblies
Air ducts and distribution chambers
Glove box assemblies
Coated trim panels, cowls, trays
Arm rests—for front and rear seats
Door trim foundation panels
Tacking strips
Trunk linings—sides and bottom
Formed plastic quarter trim panels
Heat insulation pads

Transportation (Railroad, Truck and Bus)
Interior liner panels
Decorative interior panels
Heating and air distribution ducts
Seat backs, bottoms, and sides

Furniture
Trays in baby tenders
Plastic dinette table tops
Dental table tops
Drawer bottoms
Dust partitions
Case backs and sides
Mirror backs
Chair seats and backs
Card table tops
Play pen floors

Refrigeration
Breaker strips
Lid liners
Strike plates
Flues and air ducts
Compressor fan shrouds
Shipping protection plates
Insulation pads
Machine base
Casing separators
Control covers

Radio
Perforated radio and television backs
Loop mounting supports
Television tube masks
Speaker baffles
Mounting panels
Cabinet panels
Portable cases

House Trailer
Interior liner panels
Decorative interior panels

Building
Sliding doors
Panels for flush and panel doors
Decorative wall panels
Sink tops
Counter tops
Garage door panels

Office Equipment
Machine backs and bottoms
File separators and covers
Chair mats
Clip boards
Desk trays
Blackboards
Desk tops
Table tops

Store Fixtures and Displays
Decorative panels
Silk screen products
Music stands
Easels
Display racks and cases
Bent display panels

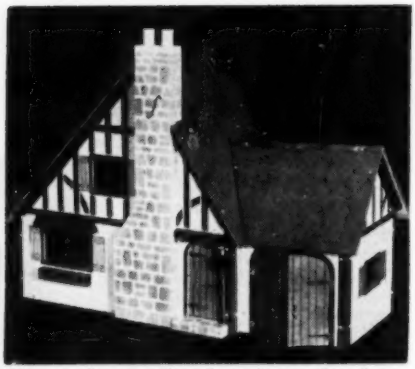
Toys and Novelties
Doll house assemblies
Doll carriage sides and bottoms
Toy garage
Paint set assemblies
Game boards
Sand box bottoms
Jig saw puzzles

General
Work bench tops
Tote trays
Collapsible shipping containers
Signs, indoor and outdoor types
Instrument panels

---

chemicals in a thin suspension, and formed into a wet, pulpy layer on a large rotating screen called an "Oliver."

From the Oliver, this layer passes under pressure rolls where some of the water is squeezed out of it, and it is compressed to about 5/8 inch thickness. The layer is then dried in long, continuous ovens until a firm, lightweight, porous mat emerges at the end of the driers. This mat is cut into approximately 4x12-foot sheets, and conveyed to a large hydraulic press made up of multiple decks.

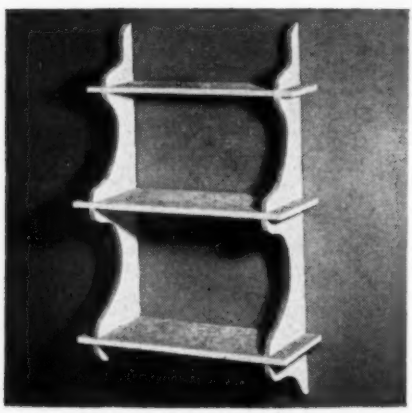


Toys such as railroad stations, play forts, etc., as well as this doll house, furnish other opportunities for hardboards.

After several mats are inserted into the press, the decks are closed simultaneously by hydraulic power, and extreme pressure is exerted individually combined with high temperature. The heat plasticizes the natural wood resins, and, in combination with the pressure, welds and bonds the fibers into a hard, homogeneous sheet or board. Thickness of these sheets of Duron range from 1/10-inch to 1/4-inch. They are made with a "regular" and "low" density. By saturating the pressed board with special oils, which are polymerized, a much stronger, harder, and more moisture-resistant product than regular board is made. This is called treated Duron hardboard.

Before the product is ready for shipment, it is "conditioned" so that it will retain, for practical purposes, its original dimensions. This is done by placing the boards in a specially designed humidifier under controlled temperature and humidity.

Methods of fabrication vary with the type of products made from hardboard, though certain types of fabricating equipment are standard with most fabricators. First step in almost all fabricating processes is the cutting of hardboard to desired sizes and shapes. This is usually done by an arbor saw. Other equipment normally needed includes routers, shapers, bending machines, and laminating machines.



Novelties can be made from hardboard.

Birdhouses made of treated hardboard to withstand weather conditions.

From laboratory table tops in our universities to attractive doll houses in our department stores, hardboards have become a recognized part of modern American living. What the future holds for hardboard use depends largely on how fast and how much the production of it expands. Certainly the demand is there. And, from all indications, it's likely to keep right on growing as more and more manufacturers and fabricators discover its advantages.

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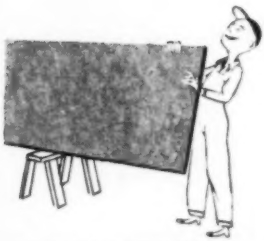

MORE UNIFORM. Uniform quality — close tolerance — means faster assembly, faster and more satisfactory finishing with less cost and attention.

PROMPT DELIVERY ***(Sizes to Fit Your Needs).*** Prompt deliveries assured through our recently doubled plant capacity. FOREST Hardboard can be cut to your advantage or you can order from stock panel sizes: 4'x4', 4'x6', 4'x8', 4'x10', 4'x12' and 4'x16'. Thicknesses: 1/8", 3/16" and 1/4". TWO GRADES: "Standard" and "Treated". Treated is recommended where end use is exposed to extra hard usage, rain and sun.

STRONGER—MORE DURABLE. Forest Hardboard is made of tough Douglas fir fibers that are refined, treated and welded together into a hard, smooth-surfaced panel . . . with all the strength and beauty of natural Douglas fir. Forest Hardboard resists cracking, chipping, denting, breaking and will not splinter. Its great strength and hardness plus *workability* fits it for a multitude of uses.

MORE ADAPTABLE TO VARIOUS SHAPES AND FINISHES. Forest Hardboard holds its strength and durability when bent and shaped. This is due to a strong bonding of the tough Douglas fir fibers in manufacturing. Bending specifications on request.

The uniform light tan color and satin-smooth surface *takes and holds* natural, stain and color finishes—from pastel shades to brilliant colors. Forest Hardboard is an ideal base for decorative overlays, decals, plastic finishes.

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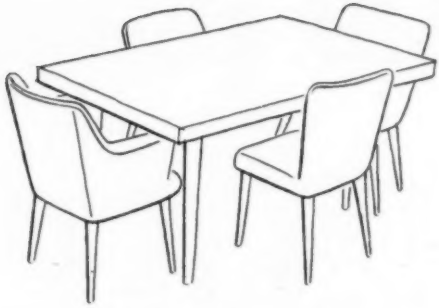

This NAIL GLIDE *stays put*

Roll threaded for extra holding power, this nail-type glide stays put in all types of wood. Assembly is quick and easy; simply drill an undersized hole and ram home. The threads, with a full inch of effective length, bite into the grain of the wood and *stay there.*

The hardened, polished and plated steel cap of this glide is cushioned against vibration noises by a thick rubber pad. This assures silent, effortless movement over all surfaces. Smooth finish prevents scarring and scraping.

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MODERN FASTENERS

Screws

By David D. Davis

Screws are generally small, without glamor and taken for granted. This article originally appearing in "Hardware Age," is published here to show the growth of the fastener industry. Wood screws are used by thousands of our readers and play an important part in helping us manufacture quality items with mass production.

THE people who make the material from which screws, bolts, nuts and rivets are manufactured, and the people who manufacture those products, can take justifiable pride and satisfaction in the knowledge that their work is a vitally important part in the production of practically all durable consumer and capital goods — the automobile, radio, washing machine, refrigerator, toaster, ironer, furniture, range, vacuum cleaner, baby carriage, sewing machine, and every other miracle of mass production that has brought enjoyment and immeasurable benefits to the American home.

Thus, from the time the average American family gets up in the morning, until it goes to bed, it is constantly using articles that depend upon screws, bolts, nuts and rivets (called "fasteners" by the trade) to hold them together.

It is a comparatively short step from the wire, rods and strip that are made on the machines, to the finished precision fasteners that meet rigid standards of accuracy and strength. Yet, that short step comprises the $300 million fastener industry which employs about 42,000 workers, and uses about 2 million tons of steel per year, or approximately 2 percent of the steel manufactured. Which brings us to the object of this article—to tell the story of how the steel wire, rods and strip are transformed into the most indispensable items in industry.

The average person knows very little about the fastener industry or its importance in industry. It has been said about screws, bolts, nuts, and rivets that "those little things are very important, but they certainly lack sex appeal." That is one way of saying that fasteners do not lend themselves to glamorous publicity . . . they lack the romantic appeal of a beautiful ship, the dynamic force of a huge tractor.

Fasteners are not performing mechanisms, but are a vital part of every one of them. Without screws, bolts, nuts or rivets no mechanism could operate. And this applies to the tiny fasteners needed to assemble marvelous scientific instruments, through the whole range of mechanical equipment to the huge tie rods that help to take the strain of presses that form ship plates.

Mr. Davis is vice president of the Continental Screw Co., New Bedford, Mass.

Every industry requires fasteners if only for plant and equipment maintenance. It can be truthfully said that all industries owe a large part of their progress and economy to the fastener industry because of its constant development of products of higher quality and greater accuracy at lower prices. Without this steady development, progress in other industries could not have kept up its pace to mass produce and sell its products at a price within the income of the average wage earner.

Although fasteners are almost as old as civilization, little is known about their early development. But we do know that even in the earliest ages, man that even in the earliest ages, man was trying to fasten things together. No doubt, the first fastener was a screw, but its origin is a mystery. There is no evidence from the relics and paintings found in Egyptian tombs that the screw was known, but what may have been the predecessor of the screw was known as early as the Bronze Age, 3000 years ago. These were copper and bronze pins found in the ruins of prehistoric Swiss lake dwellings. They have a screw form, part of the distance below the head, which kept the pin in place and made it more ornamental. This screw-form has also been found on prehistoric Eskimo bone arrow points to fasten them to the shafts more securely.

In ancient Rome ruins, a screw for wood was discovered but although the principle of the spiral or endless screw was applied for raising water in the ancient Mediterranean world, the use of screws for wood and metal was negligible. This was because of the great difficulty in making them.

The early lathe was a bow and string. The work was revolved by the string, and the file or cutter held against it with one hand. Forming a spiral thread by this method was a difficult task. About 362 A.D. the lathe was apparently improved, and screws for surgical devices were made. The nuts for bolts were threaded with a tap or a single tooth was formed to catch in the bolt thread. References made by writers indicate that machine screws were known and used as far back as the first century. A few ornaments of the 4th and 5th centuries show an early form of machine screw.

In the Middle Ages both lathes and dies were used in making screws. A manuscript of about 1475 shows a hand lathe that employed a supported screw with handle at one end that, when turned, forced a rod supported at the other end through a die, or a tool was held against the rod to cut a spiral thread.

About 1569, Besson improved the lathe for turning screws by means of a treadle and weights. This permitted the operator to use both hands. A large screw governed the advance of the cutting tool against the work. This lathe was used primarily for turning large screws from wood. The principle was later applied for turning screws from metal.

For many years, ordinary screws for use in wood, continued to be made by hand. Forged on an anvil with hammer and tongs the rods were cut off at the right lengths by a chisel. The head was then forged on the shank, and the slot cut in by a hand saw. The thread was formed with a file. The result, of course, was very crude. In England, in 1760, the Wyatt brothers attempted an improvement on this process, similar in principle to the one used by Besson in 1569. The screw blank was clamped in a lathe, and was moved forward by a screw at one end of the spindle as the blank revolved. This motion forced the blank between tools that cut the threads.

The wood screw in Colonial times

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was blunt on the end. Before it could be inserted in the wood for driving, a hole had to be bored. When the introduction of machinery created a demand for machine screws (about 1800), the inventor of the slide rest for lathes, Henry Maudslay, realized that no two screws were alike in thread formation, and that no one screw fitted in a hole bored and tapped for another. Nuts fitted to bolts had to be tied together, and if they became separated or mixed a hopeless puzzle resulted. Maudslay designed special equipment, and with great effort finally produced a uniform thread which for the first time made possible the interchanging of same size screws. This start in screw interchangeability gave impetus to the manufacture of machines, and was even more valuable in the making of repairs and replacements.

The next important step in screw making came about when a German clock maker, named Colbert, introduced drawn wire to replace forged rods for screw blanks. Through gradual improvements, wire became much cheaper and far more uniform than forged rods for screw making.

As the use of machinery increased, the need became greater for a more uniform thread in machine screws. Sir Joseph Whitworth, a former pupil of Maudslay, began in 1841 to urge the adoption of a single uniform system by all screw manufacturers. After years of effort, his standards of uniformity were gradually accepted.

Without doubt, the greatest improvement in the form of the wood screw was made in 1846. This improvement made possible the modern wood screw. Although several patents were issued in the 1830's on wood screws which would not require the boring of a hole as large as the solid cylinder of the screw before it could be turned in,

'Sitting Pretty"

- - - - now he's using

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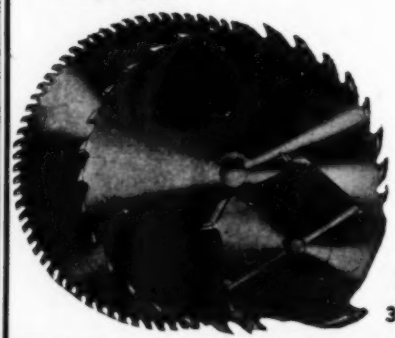

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Whether you want a relatively inexpensive mitre saw bench or the finest that has ever been devised, you'll find it in the Tannewitz line. Let us help you select the one best suited to your production requirements. Drop us a line for complete information.

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GRAND RAPIDS, MICHIGAN

XJSW— with extended table at right

XJSW — with J-430 extended sliding table at left

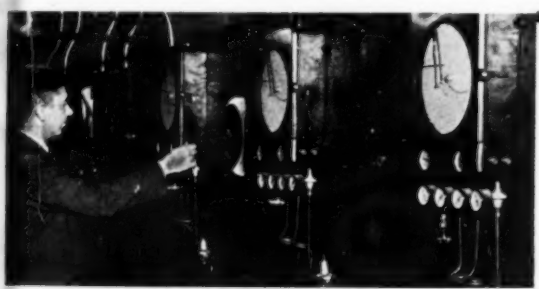
XJW — with J-420 removable roll-table at left

the results were not completely satisfactory.

The first American patent in connection with machinery for making screws was granted in 1790, and the first enterprise for the manufacture of screws in America was undertaken in 1810. A machine for making a screw with a point was patented in 1842. But going a step further, a machine for making a wood screw with a "gimlet point" was patented in 1846. In the same year a gimlet screw was patented and soon made practical. At last, it had become possible to produce a wood screw that could be driven without boring a hole in the parts to be fastened. American screw manufacturers recognized the great advantages of this new type screw and quickly adopted methods to produce it.

About 1850, machines were developed with automatic feed hoppers which held a quantity of screw blanks and fed them continuously into the machine. One hopper-fed machine turned the heads, sawed the slots and shaved off the burr left by the sawing. Another hopper-fed machine completed the operation by forming the point and cutting the thread. These machines were automatic to the point where one operator could attend to several machines, and by 1854 these machines had cut the price of screws in half! With this great reduction in price, and increase in production, the complex machine of today was made possible.

Don't miss this month's chapter on "Types of Plywood."



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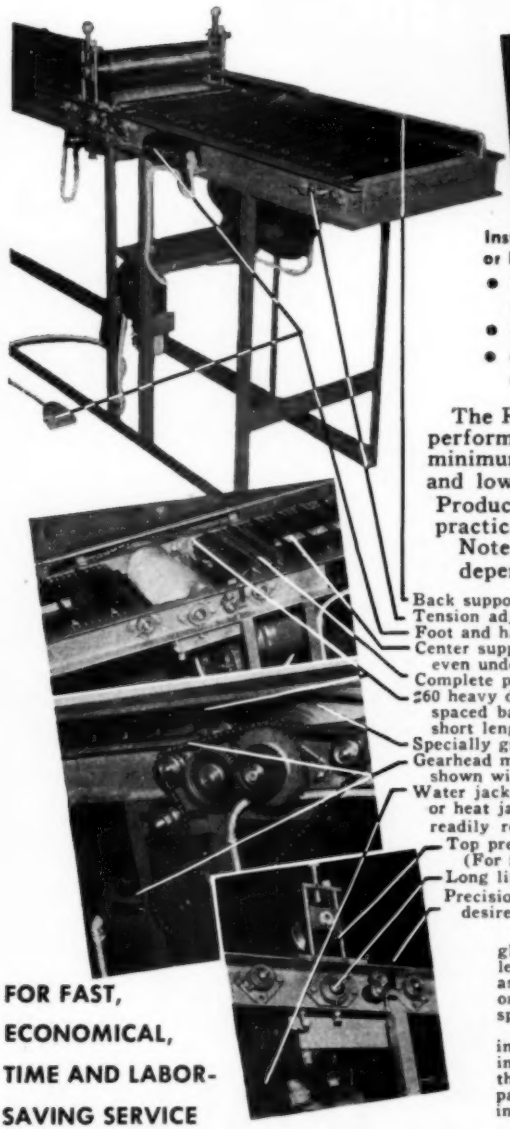

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The Raybond Glue Spreader's proven performance assures long life. minimum maintenance and low cost operation.
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Note the features of rugged, dependable construction.

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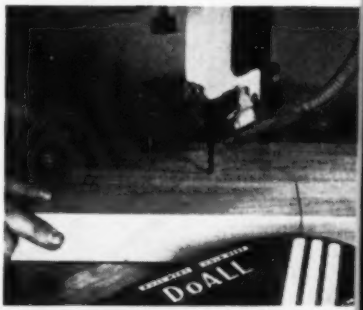

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Only the new Zephyr gives you 36" throat capacity and:

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Simplified Inventory Records

By Martin H. Hirsch

LIKE most other furniture manufacturers, the Hale Company produces in its woodworking department, based on cutting orders received from the sales department, goods in the white unfinished. These goods are then stored, pending receipts of orders from the sales force.

Orders received are typed into shipping orders for the shipping department and at the same time a corresponding finishing order is made out for the finishing foreman, provided of course, that the goods to be finished are available in the white unfinished stockroom.

Recording all these transactions for a great number of different patterns, each offered in a good number of different colors—at the same time avoiding errors, such as overselling planed cuttings, writing finishing orders for non-available goods, etc.—and also having dependable up-to-date information regarding stock of each pattern in each different finish, open cuttings available for sale, etc., proved to be a complicated and time consuming task. Up to a few years ago, the time we started our new system, our inventory records consisted of cards for every pattern and for every finish and a multitude of entries for every transaction with corresponding, practically unavoidable errors.

The new system we developed not only streamlined our inventory records, but proved itself also a big time-saver and can be considered as practically foolproof. Information in regard to the standing of a certain pattern does not have to be collected from different cards, but is available all on one sheet.

The sales department within a few seconds can judge if and when cutting orders for the woodshop should be issued. The sales department also promptly can answer telephone inquiries concerning the availability for quick service of each pattern in each finish.

The woodshop superintendent, consulting the simplified records can tell at a glance which patterns to push into the assembly departments and which patterns are still available in sufficient quantities in the white unfinished storeroom. The accounting department at any time can take an up-to-date inventory and for statistical purposes information, such as total production, shipping, finishing, etc. is promptly available.

Of course, the system developed can as well be adopted for other industries, encountering similar conditions as in furniture manufacturing. The illustration with this article shows the printed form used. It can either be punched for

Machine Tools . . . Gaging Equipment . . . Tool Steel . . . Band Tools . . . Metal Working Supplies

PATTERN

UNFINISHED | **FINISH: MAPLE**

DATE	CUTTING ORDER	ON OPEN CUT. ORDER	PRODUCTION	UNFINISHED STOCK	FINISHING ORDER	DATE	FINISHING ORDER	FINISHED STOCK	SHIPPED	ON OPEN ORDER	ORDERS RECEIVED
6/10	1000	+1000		+	—	6/12		+	—	48	+48
6/18		+ 904	—96	+ 96	—			+	—	—	+
6/19		+	—	+ 48	—48	6/19	48	+ 48	—	—	+
6/25		+ 832	—72	+ 120	—	6/24		+ 3	—45	— 3	+
6/26		+	—	+ 36	—84	6/27		+	— 3	—	+
		+	—	+	—			+	—	—	+
		+	—	+	—			+	—	—	+
		+	—	+	—			+	—	—	+
		+	—	+	—			+	—	—	+
		+	—	+	—			+	—	—	+

handling in a ledger or printed on thin cardboard, to be filed by pattern-number in a box or filing cabinet.

Three main columns are shown, one for changes in the unfinished stock and two, for two different finishes. If more then two finishes are used for each pattern, additional "finish" columns can be added to the right.

The sub-columns of this form are divided into primary and secondary columns. Primary entries are written into the left, center and right (primary) columns: "cutting order," "production" and "finishing order," respectively. "finishing order," "shipped" and "orders received." In addition of course, each entry is dated.

Secondary entries are made only after the primary entry. The primary entry is added or substracted (the + or — sign show which) to/from the previous figure in the right and/or left adjoining secondary column. The secondary columns show open cuttings still to come from the woodshop department, the white unfinished stock on hand, the finished stock and open, unshipped orders.

A step-by-step explanation of all entries made in the illustration demonstrates the simple workings of this system:

The pattern No. 206 is a new item which will be finished both in maple and walnut color.

Step 1. 6/10/51 a cutting of 1000 units, pattern No. 206, is ordered to be started by the sales department. The primary entry is made in the "cutting order" column, the secondary entry by adding 1000 to the previous balance in the secondary adjoining column "on open cutting order."

Step 2. 6/12 a customers order is received for 48 units in maple finish.— The primary entry goes into the "order received" (maple) column, the secondary entry is added to the open balance (0) in the adjoining "on open order" column. As no white stock is available yet, no finishing order is made out.

Step. 3. 6/14 an order for 120 units in walnut is received, which is handled in exactly the same way as the previous order for 48 units in maple finish, except of course, that the entries are made in the corresponding "walnut" column.

Step 4. 6/18 the woodshop assembles the first 96 units and sends them into the white unfinished storage room. The

NO: 206

FINISH: WALNUT

DATE	FINISHING ORDER		FINISHED STOCK		SHIPPED		ON OPEN ORDER		ORDERS RECEIVED
6/14		+		—		—	120	+	120
6/22		+		—		—	84	+	36
		+		—		—		+	
		+		—		—		+	
6/26	84	+	84	—		—		+	
6/28		+	36	—48		—	36	+	
6/30		+		—		—	48	+	12
		+		—		—		+	
		+		—		—		+	
		+		—		—		+	

primary entry goes into the "production" column. One of the secondary entries is written into the left adjoining "on open cutting" column, reducing the balance "on open cutting" to 904 units. The other secondary entry is made in the right adjoining column, indicating 96 units in "unfinished stock."

Step 5. 6/19 a finishing order for 48 units in maple is made. Here two primary entries are used. One in the "finishing order" column of the "unfinished" main column, the other in the "finishing order" column of the "finish: maple" main column. Of course, secondary entries are also made, showing a reduced "unfinished stock" of 48 units, the other a "finished stock" of 48.

Step 6. 6/32 a cancellation of 36 units in walnut finish is received. This should be considered a negative "order received," and filling out the adjoining, secondary column will show 48 units "on open order."

Step 7. 6/24, 45 units in maple are shipped (3 units have shown defects and are withheld). After entering 45 units in the primary "shipped" column, and after filling out the adjoining secondary columns, our record will show that 3 units are in finished stock and 3 units are still on open order.

Step 8. 6/25 the woodshop assembles 72 units.

Step 9. 6/26 the person handling the record notices that 84 units in walnut finish are required for which no finishing order has been made out. The white unfinished stock shows an available balance of 120 units. A finishing order is made out and recorded both in the "unfinished" and the "finish:walnut" main columns.

Step 10. 6/27 the 3 left behind units in maple are shipped.

Step 11. 6/29 a part of shipment of 48 units in walnut is made.

Step 12. 6/30 an order for 12 units in walnut is received.

Let us assume that June 30th is the end of the fiscal year. The necessary figures for inventory and statistical purposes are available within seconds.

36 units are on hand unfinished, none in maple, 36 in walnut.

168 units have been produced in the woodshop, 48 have been finished in maple, 84 in walnut.

48 units have been shipped in maple, 48 in walnut.

Orders for 48 units have been received in maple, 96 in walnut.

48 more units will have to be shipped in walnut to fill open customers orders.

And all from one record!

The End

TRUCK FOLDER

A new circular has been published by the Fairbanks Co., 393 Lafayette St., New York City, showing their complete line of factory trucks. First page of the circular covers the "Commander" platform trucks, the center spread their two wheel hand trucks and the last page of the four-page brochure describes special trucks.

Specifications are given for all trucks as well as details about construction.

JANUARY FURNITURE MARKET FORECAST

The February 1952 issue of WOOD WORKING DIGEST will carry a story of the market, but now as we go to press with the opening date only a few days off, we can give you some general predictions by General Lawrence H. Whiting, president of the American Furniture Mart.

All things considered it looks like a good year, provided we can find a spark for an all-out selling push during '52. General business improvements include the rising national income, high bank savings and fast moving production for the armed services. There may well be shortages during the second quarter of 1952.

In '52 as in '51 and other years, hard-hitting, aggressive selling and promotion will bring the best results, particularly when coupled with styles and materials showing an awareness of customer-thinking. Use of new woods and veneers, new finishes and special design has paid off.

All-out selling will be the theme of both manufacturers and merchants in the first half of '52. Both these groups have learned that advertising and good merchandising produce results.

Dealers coming to the markett will be looking for sales-producing merchandise. The manufacturers, on the other hand, have built more value into their crisply designed products. Furniture will be shown in greater numbers than before, but there will be fewer models in home appliances and television. Metal must be rationed for each unit, and shortages, forecast for '51, which caused the run-away market of a year ago, are likely to show up by the middle of '52.

Manufacturers' sales of home furnishings at the 1952 Winter Market will be more clearly "normal" than any similar showing at the Furniture Mart since the end of World War II.

The event will contrast with the '51 Winter show which was a "run-away" and with the Summer Market of 1951 which was abnormal. The typical retail store buyer will purchase his actual needs, and he's going to need goods. His inventory has been worked down from mid-year until it is average or nearly normal. Scare-buying will not prevail as it did last year.

Market results probably will not be uniform. The firms which offer the better values—the right styles timed right for consumer acceptance—will fare far better than the concerns which have not studied public acceptance. A number of firms have given indication of radical revision of their lines to bring them up to 1952 tastes and preferences.

Here are recent trends which have changed manufacturers' thinking for the last several years: for a good many years, there were typical three or four piece bedrooms—bed, dresser and chest or vanity—or both. Today, double and triple dressers sell where dressers never sold before. There once were panel beds and poster beds. Now, one out of three headboards sold has built in cabinets or shelf space. Armless chairs and sofas are selling in quantity. Dual purpose furniture—including sleeping equipment—is more and more in demand. More mobile furniture units are being sold because of television's impact.

The firms who are prepared to win public approval with quality merchandise styled right, may expect a good market.

BEHR-MANNING FOR *NEW* NO-FIL® ABRASIVES

A major advancement in abrasives for the furniture industry! New non-loading papers promote faster, better sealer sanding.

BEHR-MANNING is pleased to announce the addition of these great new non-loading finishing papers to its long list of firsts in abrasives.

Because they are self-cleaning and don't gum up, these new NO-FIL abrasive papers are perfect teammates for the new tough, scratch-resistant type sealer. Together, they enable furniture manufacturers to produce finishes with far better clarity, toughness and adhesion than ever before – without any change in present finishing operations – and with big savings in time, labor and paper.

The new papers are available in NO-FIL Garnet and NO-FIL Durite in the same wide grit range that has always been a feature of the regular Behr-Manning line of Garnet and Durite abrasive papers.

You can get full details and a demonstration of this revolutionary new furniture finishing team from the Behr-Manning Field Engineer in your territory. There's no obligation – just sign and mail the coupon.

BEHR-MANNING
CORPORATION
a division of NORTON Company

- COATED ABRASIVES
- SHARPENING STONES
- PRESSURE-SENSITIVE TAPES

Behr-Manning Corporation
Troy, New York

I'd like further information, and a demonstration, on the new finishing team of NO-FIL Coated Abrasive Products and the new tough, scratch-resistant clear Sealer.

*Name*_____

*Company*_____

*Address*_____

INCREASE PRODUCTION as much as 100%

Lift Installed at	Production Increase
Double Surfacers	40% to 75%
Rip Saws	30% to 60%
Cut-Off Saws	20% to 50%
Matchers and Edgers	20% to 40%
Stacking Kiln Trucks	50% to 100%
Box Car Loading Dock	25% to 50%

INSTALL LEITELT LUMBER LIFTS

A glance at the above figures, FURNISHED BY USERS, proves how Leitelt Lumber Lifts increase production.

You can get these profitable increases in production and save the labor costs of one or two men with a Leitelt Lumber Lift in your plant or yard. Leitelt Lumber Lifts are built in a full range of capacities for handling loads from three to thirty tons easily and safely.

Let Leitelt engineers solve your production problems. Write Today.

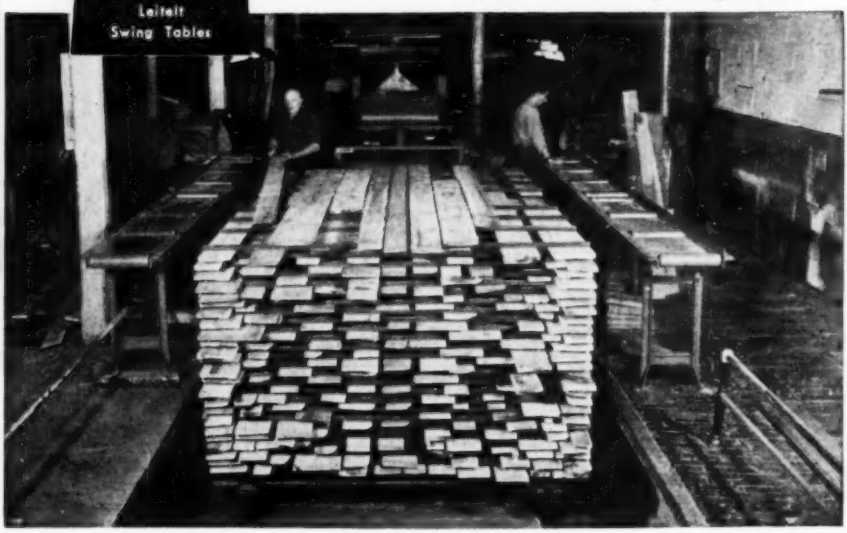
Also Manufacturers of Power Transfer Cars Car Pullers Power Driven Turntables Subcars and Leitelt Swing Tables

LEITELT IRON WORKS

"Pioneer Builders of Lumber Lift Equipment"

400 Mill St., Grand Rapids 2, Michigan

A typical modern installation showing a Leitelt Lumber Lift feeding two cut-off saws. This is how one of the largest table manufacturing plants in the country has increased their production at the vital point where material starts to flow through the plant.



Know your wood

TWELVE SPECIES REVIEWED

BY NED BAILEY

DURING the year we have been publishing a series written on this subject and featuring the most used species. This time I am going to do a little recapitulating to bring you up to date before continuing the series. The idea of doing this was suggested by some of the men at a recent F.P.R.S. meeting. For one reason or another, they had missed one or more of the articles and thought that by such recapitulation others who were interested in some particular species which had missed their attention would be able to quickly check the entire series to date.

BASSWOOD started the year in our January issue. Often referred to as the linden, whitewood or lime (by the British) this handsome, well-known species, alive or as lumber, is quite popular. Although not a truly durable wood, its many other fine qualities make it useful in many forms. It is flexible, lightweight, consistent in color, and tough enough for most any job.

The basswood or linden lives for centuries, one tree, growing in the courtyard of the imperial palace at Nuremburg is said to be over 900 years old, and as trees go that's pretty old.

ASH was our selection for February. Here again is a species that has been, to our knowledge, serving mankind for centuries. One of its most interesting qualities is that it is comparatively free from attacks by insects and disease. It has strength, hardness, stiffness, shock resistance and bending qualities, is comparatively lightweight, odorless and tasteless.

An old English superstition that has some scientific ground for its existence is that butter churned the old fashioned way would come promptly in the churn when stirred with a twig of ash. We are all acquainted with the popularity of ash for the manufacture of sporting goods because of its extreme resilience and life, for baseball bats in particular.

GUM—red and sweet—were featured in March. Gum is a species that comes in a variety of sub-species, if you can call them that. Although starting from the same origin, the geographical location of gum creates many changes in the tree.

There are a number of uses, not only for the gum lumber but the sap as well. Youngsters in the south chew sweet gum in preference to store bought chewing gum. Black gum is a tree of many names too, it is called that in 15 states; sour gum in 14; tupelo in 11 and in 8 others it is the pepperidge.

OAK, the standby through the ages, was written about in April. No tree is better known than this. Back through the ages and right up to the present, the oak has been used, immitated, sung

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BIRCH
A dependable source for
SUPERIOR QUALITY BIRCH
★ ★ ★
CARLOAD SHIPMENTS OF
BIRCH PLYWOOD
STOCK PANELS
Grades A-A, A-1, A-2, A-3, 1-1, 1-2, 1-3, 2-2, 2-3, 3-3. All thicknesses: 1/8" to 3/4". Complete stock sizes.
BIRCH DOOR PANELS
Grades available: A-3, 1-3, 2-3, 3-3, in 1/8" and 3/16". All panels are 3-ply.
All Birch plywood meets Bureau of Standards Specifications.
BIRCH VENEER
Rotary and Sliced Cut Face Veneer. Standard Thicknesses, Lengths 30" to 100". Backs, Cross Banding and No. 1 Sheet Stock.
L.C.L. OR CAR SHIPMENTS
now available from our new DETROIT WAREHOUSE including DOOR PANELS birch and gum 1/8 and 3/16. STOCK PANELS birch and gum, all sizes. SHEATHING fir and gum, all sizes.
Specify your Requirements.
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and written about. Let us hope that the blight now ravaging our oak forests will be brought under control. And don't forget that the romantic parasite, mistletoe, grows in its branches. That article also told about the many uses of oak.

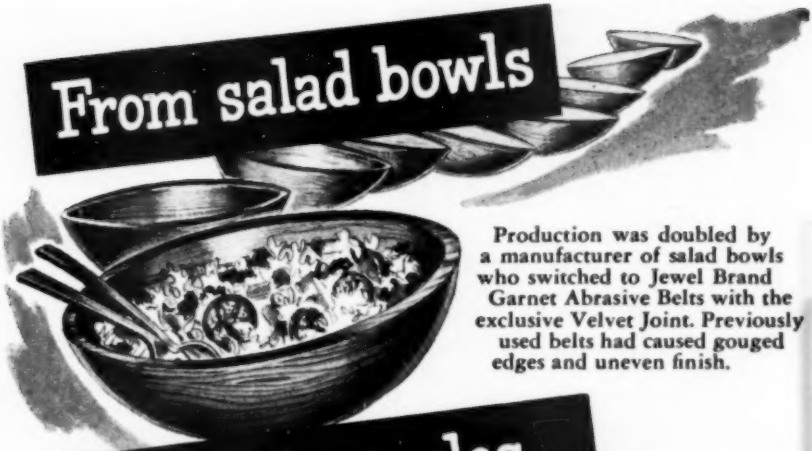
CYPRESS was featured in May. Although it may seem hard to believe, there is a cypress growing in Mexico, it is claimed to be the oldest living thing—over 5000. The cypress is another tree surrounded by superstition and legend. Perhaps its many fine qualities account for this. The cypress swamps of our southland are both interesting and amazing, many wearing draperies of moss that are 20 feet long.

BIRCH, that beautiful species which many of us remember because of the birch bark canoes famous in fact and fiction, was our subject for June. It is claimed that the first toothpick, the first venetian slat and the first paddle used for impressing school boys were all made of birch. Since there are many other uses of and features about this wood, touched on in this article, you would do well to refer to it when you can.

MAPLE, the sugar tree, came in for attention in July. Maple syrup and maple sugar are both important crops in New England. This is one case where, in a sense, you can have your cake and eat it too. Maple wood is not injured by the extraction of the sap, provided it is done properly. Although lighter than oak, maple is stronger and stiffer, ranking as one of our more valuable hardwoods.

POPLAR, the choice of landscape architects, foresters and just plain folks, has a variety of uses besides the lumber in it. These include a tonic made from the bark and root. The branches of the trees are often 80 to 100 feet from the ground and, due to the large diameter

From salad bowls



Production was doubled by a manufacturer of salad bowls who switched to Jewel Brand Garnet Abrasive Belts with the exclusive Velvet Joint. Previously used belts had caused gouged edges and uneven finish.

to TV consoles

And manufacturers of fine television cabinets are finding that Jewel Brand Natural Garnet Abrasives produce a better finish, faster . . . and at less cost than synthetic grits.

THERE'S A JEWEL BRAND COATED ABRASIVE to do every job, large or small, and to do that job *quicker, cleaner,* at *lower cost!* Ask your distributor or write on business letterhead for catalog. Abrasive Products, Inc., 551 Pearl Street, South Braintree 85, Mass.

SHARPER, TOUGHER

Jewel COATED Abrasives

CUT COSTS!

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Leading manufacturers use REISEN'S know-how to improve their products and reduce costs . . . our staff of graduate technologists is at your service to help you eliminate wood production difficulties.
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DOMESTIC WOODS: Ash • Basswood • Birch • Oak • Cherry • Maple • Poplar • Walnut • Beech • Sycamore

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Phone: New Jersey—Elizabeth 4-1500
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Butternut • Wisconsin

of the trunk, 60 inch planks and wider are often produced.

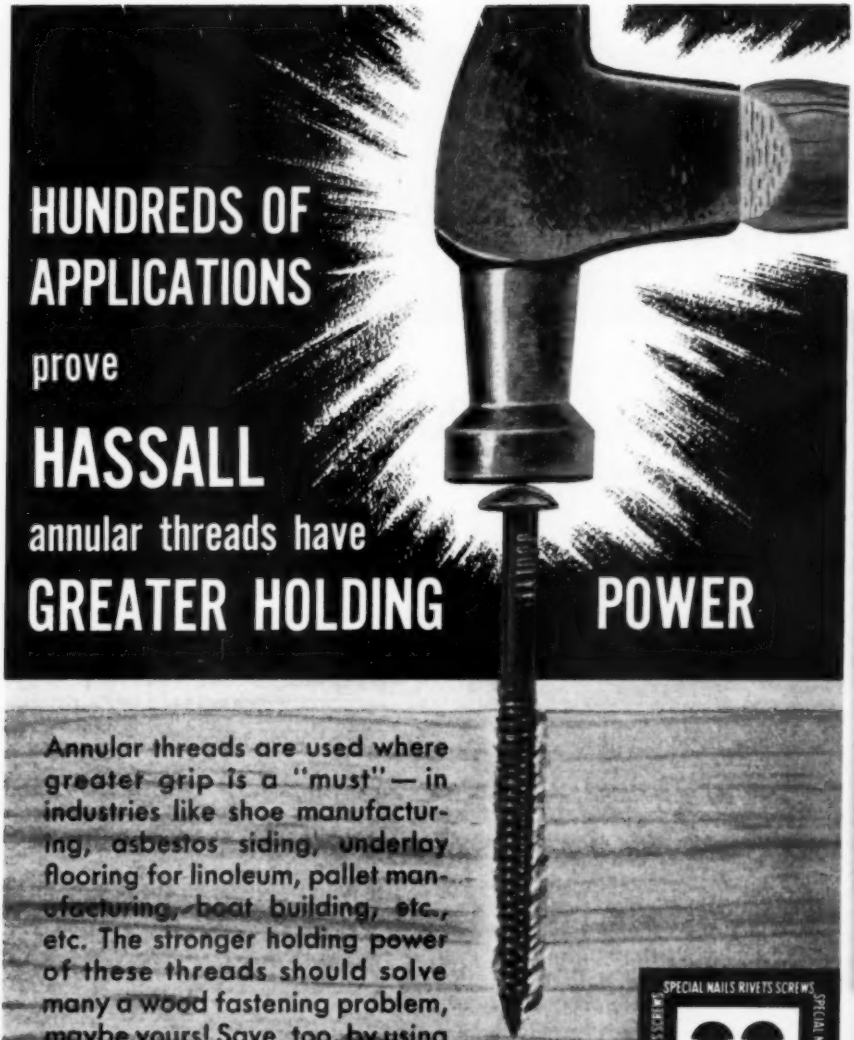
BEECH, the writing tablet of early man is a tree with an interesting history. Legend has it that the beech is never hit by lightning. In the August issue some of the wonders of this species are described as well as the many uses to which its lumber is put, from furniture to railroad ties.

SYCAMORE found its place in the October directory issue. Here again is a tree rich in legend. This deciduous giant, one of the largest in our forests, is called the ghost tree because of its light colored trunk and branches. It has many peculiarities that limit its usefulness as lumber. However, its wide distribution throughout the country has developed a variety of local uses.

CEDAR, which according to the Old Testament was used to build the temple, is described in the November issue. At other places in the Bible the cedars of Lebanon are mentioned. Several kinds of cedar are named for their color or geographical location. The lumber has many uses with outdoor uses preferred. The pungently pleasant odor of some of the cedars make it attractive for indoor and cabinet use.

HOLLY was a fitting choice for December. Decorative use of holly branches are synonymous with Christmas. For years it has been harvested with no regard for the future. Whole stands have been cut indiscriminately. During the last few years, however, intelligent forest management has been introduced into the harvesting procedures so that it is hoped that in the future more of this beautiful tree will be available for both lumber and decoration.

Poise is the earmark of a strong character. Big things are never done by fussy people.



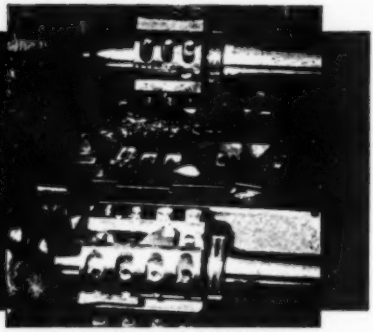
Annular threads are used where greater grip is a "must" — in industries like shoe manufacturing, asbestos siding, underlay flooring for linoleum, pallet manufacturing, boat building, etc., etc. The stronger holding power of these threads should solve many a wood fastening problem, maybe yours! Save, too, by using fewer nails. Write for samples.

SPECIAL NAILS RIVETS SCREWS
Hassall
ESTABLISHED 1850

JOHN HASSALL INC.
410 Oakland Street, Brooklyn 22, N. Y.

Another Weyerhaeuser Mill where

DISSTON Philbrick CUTTER HEADS

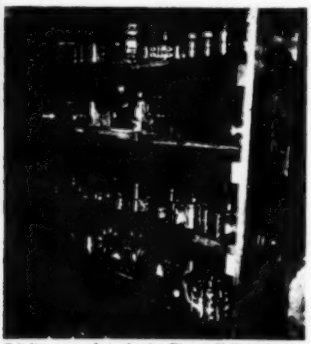


Mounted pair of Disston Philbrick Heads used by Weyerhaeuser Mill to run 4" crown moulding.

are

PREFERRED FOR PRODUCTION RESULTS!

Rough stock being fed into planer. Disston Philbrick Heads pull easily, cut smoothly, and take faster feeds because they are precision-ground, dynamically balanced.



Grinding room photo showing Disston Philbrick Heads regularly used at Weyerhaeuser Timber Company's Newark, N. J. Planing Mill.

From the rolling woodlands of the East Coast to the giant forests of the West, the name Weyerhaeuser stands for modern and progressive lumbering operations. And here, in the Newark, N. J. planing mill—as in other Weyerhaeuser plants from coast to coast—the cutter heads preferred for top quality, high-quantity production are Disston Philbrick!

Wherever lumber is planed or moulded, you'll find Disston Philbrick Generated Type (milled-to-pattern) Heads. These are heads specially designed for accurate trouble-free work: Each pair of heads can work a wide variety of patterns. Knife changes are quick and simple—no holders, clamps, or gibs! Specially heat-treated alloy heads last longer, run smoother without vibration or chatter because they are *dynamically balanced*. And the Disston Philbrick knife-and-head designs permit faster feeds and heavier cuts. Why not put modern Disston Philbrick Generated Type Heads to work in your plant. You'll get finer quality output, more footage on less investment, and lower operating costs!

Disston "Cutting Angles"—a new cutter head service bulletin for the woodworking industry—contains helpful information on improving quality and cutting costs in planing mills. If you'd like to receive it regularly, write on your letterhead. Also FREE wall chart for planing mills showing standard woodworking patterns.

FIGHT WASTE

"SCRAP TURNED IN...IS STEEL TURNED OUT!"

Steel mills urgently need more scrap *now*. You can help by keeping your steel scrap moving into channels serving steel mills.

HENRY DISSTON & SONS, INC.

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The Ounce of PREVENTION

By Kelcy Kern

EACH year 300,000 eye accidents happen to industrial workers on the job, mainly because ordinary protective precautions have not been taken. The estimated cost of these accidents has been conservatively placed at $200,000,000.

Many Canadian woodworking jobs expose the eye to injury more than others, but most woodworking shops subject a large percentage of their operatives to eye injury every day. Almost every phase of shop work entails constant exposure of the eye. Losses due to eye injury—no matter to what degree they may prove disabling—are costly to both employee and company.

The American annual shop accident incidence picture looks like this.

170,000—to the hands
115,000—to the head (except eyes)
110,000—to the eyes
95,000—to the feet

The average frequency rate of disabling eye injuries has been put at 0.67 man hours. Owing to the nature of woodworking shop operation, these figures will prove significant to the employer.

The woodworking shops of this country as a whole are becoming more and more willing to adopt preventive safety measures and methods for employees, including the widespread use of safety goggles. But, in many instances, management is not keeping eye accidents to a minimum because the eye protection they are providing is not adequate. Sometimes not enough care has been taken to select the right safety goggles for the job.

Certainly the eyes of our woodworkers will have to be given protection if we are to get the production rate called for. This, of course, is the case with all safety measures. For too long, however, some employers have supplied their employees with old style goggle designs, being in many cases simply unaware of the vast developments of the postwar era in goggle design and goggle research work.

The objective of the employer who wants to reduce eye accidents must be above all to select properly the type of modern improved goggle best suited to the individual job involved. This is especially important now when the defense production program is getting underway throughout industry. This

writer has found that industrial plants and others requiring the protection of safety goggles are closely re-examining this whole problem of goggle selection.

How shall the woodworking foreman go about best meeting his needs from among the means of eye protection available today? Above all, he will see that the goggles are so designed for comfort that the worker will be willing to wear them on the job. That means that they must be light, fit properly and meet recognized standards of optical quality. Next, he will see that the goggles selected have passed all government tests and also that they are made for long wear. The advances in achieving long wear materials have been especially notable. Then, he will consider the important question of the material to be used. Will the goggles be of plastic or of glass?

Regarding the plastic or glass question, plastics are becoming more widely used for purposes of eye protection. It is time that we paused and took stock of the effectiveness of this material. Do plastic lenses measure up to glass? Are they better than glass? Are all plastics equally suitable?

What are the advantages, if any, of plastic safety goggles? The question may be answered thus: a) Plastics are light, and accordingly bring more comfort; b) Because of their structural qualities they better resist, in many cases, dangers to which the worker is exposed.

One goggle manufacturer says, "Plastic eye protection has finally reached the important position in the safety field which it has long deserved. It has consistently proved itself in industry by meeting the most rigid job requirements. In order to satisfy most job requirements, eye protection must be safe, comfortable and well styled. The latter two points are considered very important by safety engineers who want to induce more workers actually to wear the goggles which are provided.

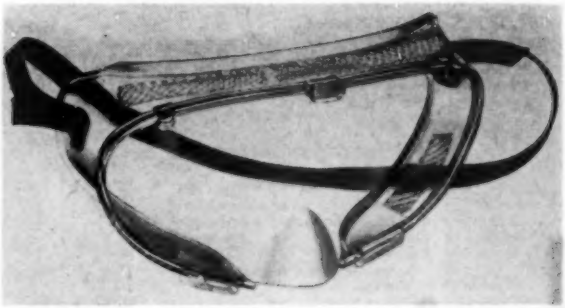
"The viewpoint of the average designer or manufacturer of plastic eye protection is, 'How can we best adapt and improve plastic material to its important job in the safety field, always bearing in mind what is new today may be the standard tomorrow.'

"The challenge is to see how the plastics industry can best interpret the demands of workers as a whole, and also meet existing standards for impact and optical tests. In short, we want to provide industry with the finest eye protection available."

Today the plastic type goggle is supplied in various styles and types—each designed to give maximum protection at a specific job. Plastic side shields for various types of industrial goggles are recommended for many occupations where small flying particles are involved as in the machine shop. In many cases they have successfully met the objections of employees to side shields of other materials which obstruct the vision, are heavy or are uncomfortable to wear. These shields may also be tinted to reduce possible side glare.

One of the most successful uses of plastics for eye protection has been in the manufacture of face shields. In many cases protection is needed for the whole face, unusual atmospheric conditions cause goggles to become fogged, or a face shield is more acceptable to an employee. Face shields are made in a variety of lengths for different degrees of facial protection. However, when the adoption of curved face shields is contemplated, they should be critically examined for possible distortion.

As both research and practical applications have shown, each kind of plastic has its own area of use and its own limitations. As a group, plastics can



Plastic goggles for safety first.

hold their own with glass against impact hazards at ordinary temperatures, are less successful at low temperatures, and in two cases are better at high temperatures. They have a definite superiority as far as molten metal splash, high-velocity impact and some chemicals are concerned. They are inferior in respect to abrasion, sharp impact and should be avoided whenever there is a possibility of injurious light radiation.

Numerous types and applications of plastic goggles have been devised and produced with a view to (a) safety and (b) comfort of the employee. It is recognized that unless goggles, regardless of type, provide the maximum of comfort and personal eye-well-being, it is hard for the shop foreman or safety supervisor to make sure that they are in constant use every working hour on every woodworker.

Face shields where protection of whole face is advisable.

To summarize: In order to attain maximum eye protection for his workers, each safety supervisor or foreman should follow this procedure:

1. Analyze the eye hazards of the job and needs of the worker.
2. Select the most modern, improved goggles available for maximum safety on each job.

The importance of adequate eye protection looms large in the mind of the woodworking shop employee when he thinks of these questions: How important is it to attain the maximum of eye protection in my plant and what does it cost?

The cost of eye disablements are reflected in workmen's compensation alone at about $50,000,000 per year over all industry. To this must be added loss through inefficiency after injury or loss of sight.

It will thus be seen that inadequate eye protection costs plenty and that the way for the employer to keep the eye accident costs in his job to a minimum is to realize that safety goggles must be selected to fit the job they have to do. Today, this is the very crux of the eye protection problem in the industry.

The End

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FIRE PREVENTION

Good safety practice, combining the proper placement of automatic pressurized ceiling fire extinguishers with other protective measures such as fuller's earth on the floor and a fire door equipped to close automatically in the event of fire, is demonstrated in this storeroom set-up by Stop-Fire, Inc., Brooklyn, New York.

Such storage of inflammable paints, solvents, etc., is, in itself, good housekeeping. The powdering of all floor surface with fuller's earth precludes, of course, injurious falls on oily waste.

As well as offering around-the-clock fire proection, these SP-30 ceiling extinguishers, permit easy placement of such protection where it is needed most—directly over such danger zones as this. They are readily suspended at any ceiling point for the detection and rapid control of incipient fires. When the temperature reaches the melting point of the fusible element in the sprinkler head, the unit instantly discharges a wide-circling, fire-smothering spray of chlorobromomethane, a new extinguishant. The extinguisher is pressurized at 80 psi. The expellent is CO_2.

The fire door (ordinarily closed) is equipped with a fusible element on the door stay. In the event the door is inadvertently left open and fire breaks out, the door will roll to closed position, confining the fire to the store room.

MATERIAL HANDLING

An analysis of 1,000 accidents in the woodworking industry shows that handling material accounts for one-third of all lost-time injuries - the greatest single cause of injuries in this field.

Moreover, handling material accidents cause 6% of the total number of fatalities and permanent total injuries where the injured person is so crippled that he is never able to return to work.

They cause 21% of the permanent partial disabilities where permanent effects such as amputations and irreparable dislocations result.

Analysis of handling materials accidents develops the following unsafe working practices:

Allowing hands to be pinched by moving materials 13.4%
Objects falling because of poor grip 12.8
Failure to wear safety shoes .. 12.8

Lifting in an awkward position ..12.1
Failure to use mechanical equipment provided 11.5
Lifting with the back instead of the legs 11.0
Standing in unsafe and crowded areas 9.1
Failure to wear hand protection .. 6.8
Miscellaneous 10.5
Total 100.0%

The hazards of handling material are common hazards that can and should be licked. Make sure you're doing your part.

LUMBER GRADING SCHOOL

Those are the key-words in five months of intensive training for "cub" inspectors and other jobs in the lumber industry. The site is the N.H.L.A. hardwood lumber inspection school at Memphis, Tenn.

Under the careful leadership of Mr. L. C. Nicely, Ass't. chief inspector, remarkable results have been achieved. Director Nicely considers his practical course—theories, for the moment are pleasantly ignored—equivalent to five years' "trial-and-error" training in the "old school."

The school is endorsed by the Association, and each applicant must be sponsored by an Association member to insure his talents, ambition, and character.

Of the 52 men in the present class, only 22 are available for employment after graduation Feb. 14, 1952. These are a composite group. Some have previous experience in lumber or technical training, some have college degrees in forestry or other arts and sciences. And while they are being trained primarily as hardwood inspectors, their various backgrounds fit them for many other phases of the trade as trainees.

Inquiries regarding these men, or the next class, which convenes Feb. 15, 1952, should be addressed to Director L. C. Nicely, the John W. McClure School of Hardwood Lumber Inspection, 2673 Hanover Ave., Memphis, Tenn.

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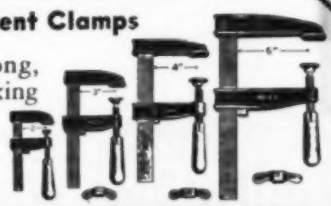

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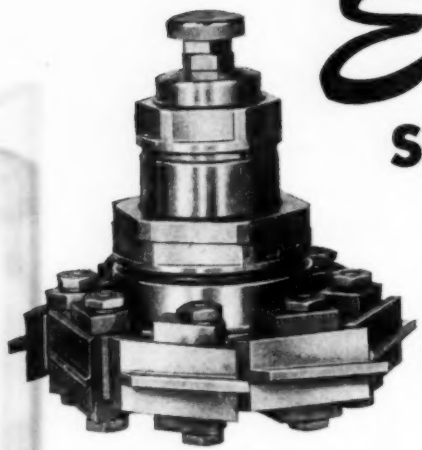

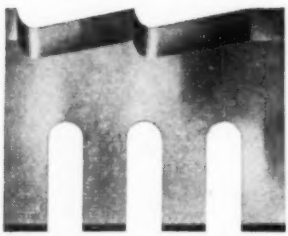

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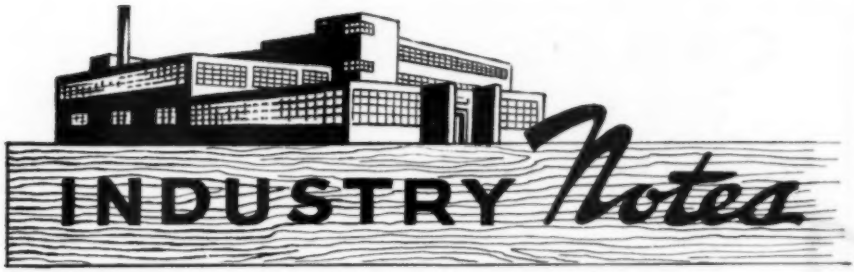

IMPROVEMENTS AT BIRDS EYE VENEER COMPANY

The Birds Eye Veneer Company, Escanaba, Michigan, recently purchased the veneer plant of the Escanaba Veneer Company, of Escanaba, known as the green mill, which they have been operating on a lease for the past ten years.

The Birds Eye Company installed a new modern Coe Dryer and face-lifted the plant with fire-proof sheeting.

Also, they have just started up a new Capital 150" hydraulic tilting and chucking slicer in the main plant. A new Proctor & Schwartz, one-way dryer is to be installed.

Their new warehouse is fully equipped with humidifiers to insure moisture controlled tenderized veneers.

CURTIS PURCHASES AMERICAN PLYWOOD CORP.

Curtis Companies, Incorporated, Clinton, Iowa, has announced the purchase of American Plywood Corporation of New London, Wisconsin, and its wholly owned subsidiary, American Veneer Corporation, Oconto, Wisconsin. All capital stock of American Plywood has been purchased outright, including all real estate, equipment, timberlands, contracts for logs, patents, trade names and other assets.

The purchase augments the production facilities of Curtis Companies, Inc., now ending its 85th year as a leading manufacturer of woodwork, with a line of flush doors, plywood, veneer and fixtures. Brand names formerly used by American Plywood, among which are New Londoner and Plyoneer, will be continued with the addition of the prefix "Curtis." No changes of present personnel are contemplated.

CERTIFICATES AWARDED

Certificates of appreciation for patriotic civilian service to the Department of the Army have been awarded to D. G. Coleman, G. K. Dickerman, H. O. Fleischer, J. A. Liska, E. G. Locke, J. N. McGovern, J. F. Saeman, R. M. Seborg, and C. V. Sweet. This was for their services on the Technical Industrial Committee, Joint Chiefs of Staff, during World War II which involved acquiring technical information on wood utilization in Germany. All the foregoing technicians are on the staff of the Forest Products Laboratory, Madison, Wis., except Mr. Dickerman, who is technical director, Consolidated Water Power and Paper Co., Wisconsin, Rapids, Wis.

This award is the highest civilian award given by the Army. Presentation was made by Col. W. G. Skelton, Commandant, University of Wisconsin, ROTC.

A.M.W.M. MEETS

Hotel Statler, New York City was the meeting place for the Association of Manufacturers of Woodworking Ma-

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chinery on December 13 and 14. Purpose of the meeting was to discuss problems of operation under the defense program and effects of the CMP and OPS regulations. Hal Kroeger, well-known business consultant spoke on general business outlook and current trends.

"The Effect of Machine Design and Construction on Carbide Tool Performance," was an address delivered by R. D. Brooks of Firth Sterling Carbide & Tool Co., Pittsburgh. It is expected that the woodworking machinery manufacturers will join with other groups in the industry to investigate the possibility of improving carbide tool performance and advance the use of such tools.

The program also included round table discussions of current business conditions in the industry, pension plans and the effects of foreign competition.

RECORD CONSTRUCTION YEAR

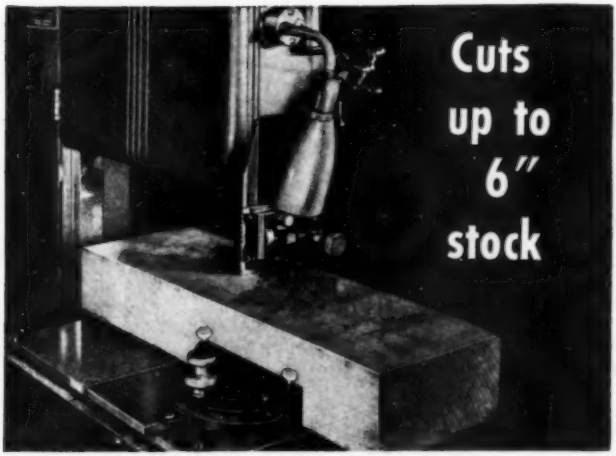
With still one more month's construction contract awards to be tallied, the year 1951 has topped the previous record 12-month total set in 1950 by nearly $16 million it has been revealed in F. W. Dodge Corporation figures for the 37 states east of the Rockies.

The first 11 months of the current year had awards reaching $14,516,792,000. The entire year of 1950 totaled $14,501,-055,000. This huge total for 1951 through November has already exceeded 1950's yearly figure by less than one percent, the Dodge construction news and marketing specialists stated.

The first 11 months of this year were also a full nine percent greater than the first 11 months of last year.

During November, awards totaling $931,768,000 were 11 percent less than October and 14 percent below November 1950.

Non-residential awards in November were $327,706,000 or 22 percent lower than October and 25 percent behind November a year ago. Residential



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PLAINFIELD, N. J.

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JIG SAWS RADIAL SAWS LATHES TILTING ARBOR SAWS

awards of $443,884,000 were 11 percent lower than October and 11 percent less than November 1950. Public and private works and utilities of $160,178,000 were 17 percent more than October and three percent higher than November last year.

Eleven-month 1951 totals with percentages of comparison with 1950 were as follows: Non-residential, $6,229,506,000, up 33 percent; residential, $5,859,284,000, down six percent; public and private works and utilities, $2,428,002,000, and two percent.

KITE STICKS WANTED

A New York state manufacturer is anxious to locate a source for lumber to be converted into 5/32x5/16x30 to 36 inch kite sticks. Their prime requirements are low cost, lightweight and minimum warpage and number of sound pin knots. Mill ends, cut-offs or trim would be of special interest.

If you can supply these items, please write to Dept. WD, WOOD WORKING DIGEST, 222 E. Willow, Wheaton, Ill., and we shall forward your letter.

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SECTION

COLOR IN MODERN FURNITURE FINISHING . . . Part 2

By H. H. Connelly

TWO methods are practical for applying color to wood: (1) By oil pigment wiping stain sometimes incorporated with the filler and (2) by spraying a liquid stain on the wood surface. This latter can be secured in powder, soluble in water, spirits, or oil. A few justifiable drawbacks are credited to each. Therefore, a brief analysis of each stain is helpful to the furniture finisher.

How To Prepare Your Stain

The water soluble stains are made from powders of the aniline dye family. Sometimes we refer to them as acid stains. Their behavior is quite favorable. They produce good tone depths and the colors are there to stay. No fade out when exposed to sunlight. Their main drawback is that they are carried in water. Water, being cheap, is not a drawback. It's a fact that we in the furniture industry abhor the practice of wetting good wood which we have spent money to dry. It not only plays hob with the grain, but it means more sanding than necessary.

Then we have other stains called oil soluble stains. These, too, are usually aniline dye colors but made to be soluble in oil, aromatic hydrocarbons, and other like liquids. You will find these stains to be penetrating with a clear tone. Neither do they raise the grain. We think we have something. But wait! Being slow driers they hold up the works for present day fast finishes. Another strike against them is the blotchy coverage that shows up after drying.

The nearest thing to a wonder stain, you will find, is non-grain raising stain. They are soluble in quick drying liquid. The main carrier is wood alcohol (a point in its favor) and a small amount of solvent called monoethyl ether of ethylene glycol. The evaporation of the liquids is quite rapid, leaving the wood dry within a few minutes. Filler or sealer can be applied almost immediately without harmful effects. Here's a handy thought regarding non-grain raising stain for the finisher of wooden furniture. You can secure the primary colors and through intermixing derive at any shade or hue you wish.

Also, it is well to emphasize that being able to mix stains and colors for modern furniture production is important. But once you have developed a new color, submit this sample to a finishing material supply house and let them duplicate it in mass quantity for your production job.

This isn't difficult. Remember our ancestors were using colors satisfactorily during the stone age. But the real advancement of color utilization didn't start till an adequate explanation was made as to just what color was and how it was made.

In 1670 the man who was soundly thumped on the head with an apple, resulting in the law of gravitation, came up with the first explanation of color. He showed that color evolved from light, by using a glass prism to break up the light beam into the spectrum band consisting of red, orange, green, blue and violet. Newton also noted the conspicuous absence of purple. But he found that even this could be reproduced by overlapping the two outer bands, red and violet. From this simple analysis he formed a common circle with the spectrum band, giving us the color circle with the intermediate hues and shades that go to make up our modern color library. It is this color circle you will need to formulate that special stain.

For preparing your color stain, your first move should be to establish a working laboratory somewhere in a corner of your finishing room. Select a spot well lighted, preferably by natural northern reflection. This, it has been proved, gives the best source of light for color blending. The second step is to secure the primary colors, red, blue and green in oil in either tubes or cans. Also white and black should be on hand. With a few boards, earthen and glass vessels, thinners, measuring devices such as scales and test tubes you are ready to work up any color in the rainbow.

Remember with red and yellow we produce orange. With yellow and blue, green; and with blue and red we get purple. By adding white in varying proportions we end up with tints. When we add black we have a shade. If this sounds too complicated, try the Bustonaby's color system. In this color chart you will find every conceivable color that could possibly be imagined by a furniture designer. When he recommends a definite color it is fairly simple to identify the required color from the chart. To duplicate this, simply follow directions.

Stain First

For an even color apply non-grain raising stain with a spray gun. A regular production type gun fitted with an FX needle and a No. 30 air cap gives excellent results. An air pressure of 45 or 50 psi. is sufficient. However, this should be a sustained pressure or you will encounter difficulty in producing the density of color required. Frequently a fluttering of the spray gun will occur resulting in a blotchy coat. Most fluttering of spray guns is caused by a leaky air line or dirt in air cap.

The stain coat should be heavy. Care should be taken to shoot the spray well into the grain. For in producing colored grained oak or walnut the completeness of the job will depend upon how thoroughly you have laid the stain in the grain.

After staining with non-grain raising stain you can immediately proceed into the second step. However, if a water stain has been used, sufficient time should be allowed to completely evaporate the water absorbed by the stain. If the building is well ventilated, four to six hours should be sufficient. Most concerns provide overnight drying in a heated room. With water stain, a light

scuffing with steel wool or a No. 5 sandpaper is advisable; but not too hard. Vigorous sanding will go through the stain leaving a blotchy surface.

Next Is Toning

Tone is a generalized term often alluding to any color not easily identified as a simple tint or shade. Therefore, when we speak of toner we refer to a practice in the furniture finishing field of reducing the color. In this case our toner is made of any color under the sun that happens to meet the fancy of the designer.

For instance, a short time ago there appeared on the market a radical color design in an oak set. The grain patterns were well defined by a color as red as a turkey gobbler's snout, but the flat portion of the grain was a wheat color. The red was produced by the stain and the wheat color was the toner applied over the stain.

For a lacquer finish, a toner is made by adding pigment colors to lacquer and spraying over the stain. Here a gun pressure of sixty pounds should be used or the spray pattern will fail to atomize properly. A pressure feed tank is best for supplying the toner material. Watch the fluid hose. Use only a new or clean hose that is free from previous colored material. A slight absorption of a foreign color may be enough to completely change the shade desired.

Apply the toner heavily enough to completely hide the stain on the flat portion but not heavily enough to penetrate the grain and cover the color secreted in the pores. This is the secret of a good grain coloring job. Allow from two to four hours for drying after toning. More time will be required in finishing rooms of poor circulation. If you have forced drying, an oven temperature of 140° F. is recommended.

Wash Coat and Fill

After drying, all parts should be inspected for hungry wood. For those places that show a definite lack of color a touch-up operation is recommended. A light sanding follows. Your stock is now ready for the wash coat. This time the mixture consists of three parts of lacquer thinner and one part of lacquer. A thorough wetting of the surface by spraying will suffice. Many concerns equipped with a conveyor apply this over the toner soon after the initial drying has progressed to the point where sagging is not dangerous.

Filling the wood pores with a colored filler is a second method of obtaining colored wood grain decoration. With this method we first apply the toner as described above. The staining is left off. After toning we add a wash coat by spraying a solution of lacquer cut three to one with thinner and allow a drying time of two to four hours between coats. A light sanding should follow.

To the filler is added the colored pigment in varying proportions depending upon the degree of color intensity one is seeking. For instance, in the case of the red mentioned above, vermillion pigments ground in oil are added directly to the natural or white filler. Don't forget the importance of thorough mixing at this stage. Poor color mixing is a major culprit when it comes to faulty color finishing.

Since the flat portion of the wood has been coated with toner and lacquer wash coat, no color absorption will be experienced on these areas. Only the porous grain will drink up the pigments. The filler can be sprayed using a No. 54 air cap, a 25 to 30 psi. gun pressure and 5 to 15 psi. on the pressure feed tank. The filler will necessarily have to be thinned to spraying consistency. When the filler begins to flash, it should be wiped from the wood across the grain. Wiping with the grain

will tend to remove the coloring from the pores.

When the job is completed no filler will be on the surface and the grain patterns will be nicely defined by the colored filler. A four hour drying period is recommended on most fillers. Some may require overnight drying; others may require heat to set. The best procedure is to check with your supplier for his recommendations.

No sealer is needed under the lacquer top coat. As soon as the filler is dry you are ready to apply the lacquer as a final application. This should be applied by gun and a measured film thickness of one and a half to two mils in thickness.

Bone White Finish

For most furniture manufacturers a bone white finish means painted furniture; and it is generally confined to furniture groupings of bedroom suites, dinettes and novelty pieces. Most woods of close grain texture lend themselves well to this type of finish. Gum, poplar and basswood make excellent furniture for finishing bone white in the medium and low price markets. One concern making bedroom furniture is using tupelo gum exclusively for these items. It is selected for clear grade and receives an excellent polish sanding before going to the finishing room. Because the finish brings out the grain character, only the best straight grain texture is used for front and top pieces.

The first step in the finishing process is a wash coat using a sanding lacquer cut three to one with lacquer thinner. The second step is spraying with a white flat drying lacquer enamel. This is laid on the wood thin enough to just barely show the grain pattern when dry. Frequently an unusual variation can be made by altering the wash coat by adding a slightly darker color. Often a tint of umber or burnt sienna is used. The same effect cannot be obtained by adding the color to the enamel. The top coat consists of two lacquer coats followed by rubbing and polishing.

The modern wheat finish is a variation of the bone white finish but is obtained quite differently. The first step is staining, a necessary one since we are starting out with a wood bare of a light color and stepping into the shades unless mahogany is being used. Since modern mahogany is often finished in this color, a bleaching operation as previously described is the first step.

Staining with a N.G.R. stain of yellow color is the first operation for a wheat finish. Other methods of staining, of course, are pigment wiping stains of the ochre shade. However, if the wiping stains are used, sufficient drying time should be allowed before the second step.

A wash coat may be used, but many finishers feel this is a waste of time at this point unless filling follows. In general, if porous open grain wood is being used, a filling operation must follow. The filler for mahogany or oak would be tinted slightly with ochre with traces of burnt umber added to darken.

Following a drying period the wood is now ready for a sealer coat, dry and sand. Two top coats of water white lacquer should follow with a drying time between coats.

The End

The best way to teach our young people the meaning of our democratic freedoms is to demonstrate, by our own example, that we have mastered the three R's of citizenship—rights, respects and responsibilities. — **Earl J. McGrath**

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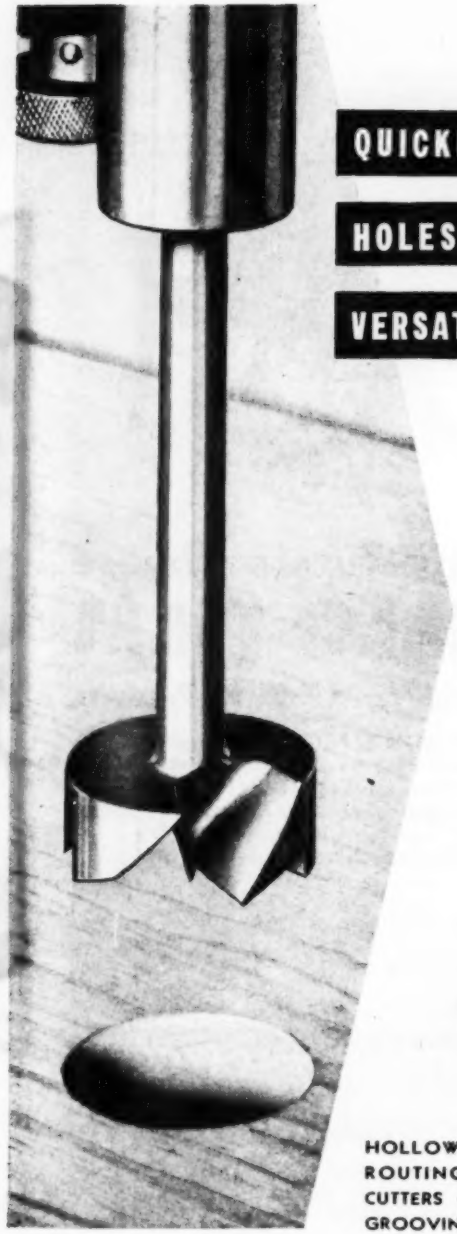

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HOW CAN BLACK WALNUT GUNSTOCK BLANKS BE KILN DRIED WITHOUT HONEYCOMBING?

This month's report has been prepared by John M. McMillen, technologist, U. S. Forest Products Laboratory, Madison, Wis.

THERE are two keys to the prevention of honeycombing in gunstock blanks: (1) good end coating; and, (2) temperature control. Most honeycombing in walnut gunstock blanks starts as end checking. The end checks penetrate into the blanks and open up into honeycomb checks when kiln temperatures are raised too rapidly.

End Coating

A hot-dip, pitch-asphalt end coating developed by the Forest Products Laboratory and widely used by the gunstock industry will prevent end checks. The composition of this end coating, by weight, is: 60 parts of 213 degree F. coal-tar pitch; 25 parts of 155 degree F. coal-tar pitch; 15 parts of 210-220 degree F. asphalt.

This coating can be applied by dipping, but the use of a roller device described in U. S. Forest Products Laboratory Report No. R1435 is preferable. Plain asphalt of the 210-220 degree F. type also has been used successfully by some plants. The higher melting pitches used alone are too brittle. They chip during rough handling and leave some ends poorly protected. Lower melting pitches run off in the kiln.

Kiln Temperatures

Kiln operators who have had little or no experience with gunstocks or who do not have definite knowledge that their kilns maintain uniform temperatures throughout, with no "hot spots," should not exceed the dry-bulb temperatures given in Table 1.

This is schedule T3-D4, from U. S. Forest Products Laboratory Report No. D1791, "Schedules for the Kiln Drying of Wood." By using this schedule, an operator can be reasonably sure that the dry-bulb temperature will not be excessive before the cores of the blanks are dried below the danger point for honeycombing. This schedule, when used in a modern kiln with forced-air circulation at 200 to 300 feet per minute, should dry black walnut gunstock blanks, 2½ inches thick, in approximately 65 days.

Kiln Check-up

Since excessive kiln temperatures may be disastrous, a kiln check-up should be made before each charge of gunstock blanks is dried. Fans, coils, traps, automatic coil and spray valves, and hand shut-off valves should be examined. Booster coils between the loads in multiple-track kilns should be shut off when drying gunstocks, unless it has been found by temperature checks that they do not produce excessive temperatures. The recorder-controller should be calibrated so that the tem-

Table 1.—**Beginners' schedule for walnut gunstocks**

Moisture Content		Temperature		Relative Humidity
From	To	Dry-bulb	Wet-bulb	
Percent	**Percent**	**°F.**	**°F.**	**Percent**
Initial	50	110	103	78
50	40	110	100	70
40	35	110	95	57
35	30	110	85	36
30	25	120	80	17
25	20	130	80	10
20	15	140	90	14
15	7	160	110	21
Equalize		160	131	44
Condition 36 to 48 hours		160	150	77

peratures set and recorded are the same as the actual temperatures at the instrument bulbs in the kiln. During a test run on some non-critical material before attempting to dry gunstocks, entering air temperatures should be observed in different parts of the kiln to see how close they are to the actual temperature at the instrument bulbs. When considerable differences are found, measures should be taken to correct the faulty conditions and eliminate the differences, if possible. If the differences cannot be eliminated, the dry-bulb temperature should be underset on the instrument enough to compensate for the excessive temperature in the hottest zone. If undersetting of the dry-bulb temperature is necessary, cold zones of the kiln should be watched for formation of mold. If mold occurs, the wet-bulb depression can be increased 1° or 2°, or, if necessary to restore circulation, a brief high-temperature, steam-sterilization treatment can be used. Undersetting of the dry-bulb temperature should be continued with each new temperature step, unless additional temperature checks show this is no longer necessary.

Stacking and Sampling

To insure uniform drying, gunstock blanks should be stacked on stickers, with air movement parallel to the stickers. If it is necessary to place the sticker in another way, at least 1 inch of space should be left between blanks. Where the air circulation is not good, the blanks will dry more slowly and be subject to honeycombing when the temperature is raised on the basis of faster-drying samples.

The drying of gunstock blanks is a precision job. It requires the use of the best kiln-sample procedure. Beginners should use at least 12 samples, representing both the driest and the wettest material in the load. Sample pockets should be not closer than 2 feet from the ends of the loads. Samples should be placed in loads throughout the length of the kiln, making sure that some samples are located in both the hottest and coldest zones. The pockets should be numbered, so that each sample can be returned to its own pocket after weighing. Changes in kiln conditions should be based on the average moisture content of the three wettest samples.

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When the average moisture content of the three wettest samples is down to 15 percent, sections should be cut out from six blanks for intermediate moisture content determination. Moisture content corrections can be applied to all of the other samples. The driest sample should be dried to 6 percent before starting equalization. The wettest sample should be dried to 8 percent before starting conditioning.

Equalization brings the moisture content of individual blanks within a narrow range. This step may not be necessary if the moisture content of the blanks is nearly uniform at the start, and the operating conditions throughout the kiln are uniform.The conditioning treatment relieves case-harding stresses. It is not necessary to steam the blanks during the drying, and prolonged steaming before the blanks are dry may promote honeycombing.

The final average moisture content, moisture content of the blanks of the shells and cores, and extent of case-hardening relief should be determined by cutting sections from all samples after conditioning is completed.

Accelerating Drying

An accelerated kiln schedule and other detailed suggestions for speeding-up the drying of gunstock blanks are described in U. S. Forest Products Laboratory Report No. R1433. Considerable experience should be attained drying gunstocks, however, before attempting to use this schedule. As an approach to a speed-up, schedule T5-D4 from U. S. Forest Products Laboratory Report No. D1791 is suggested. By following this schedule, drying time should be reduced to approximately 55 days. Use of the fully accelerated schedule should reduce drying time to 45 to 50 days.

If it is necessary to dry gunstock blanks in a natural-circulation kiln or a kiln with very slow air circulation, the wet-bulb depressions can be increased 2° to 4° during the first two steps of the kiln schedule.

If drying lags in any type of kiln and contract requriements necessitate speeding-up drying, such action should consist of lowering the relative humidity a little faster than called for in the T5-D4 schedule. No attempt should be made to gain time by raising temperatures above those shown in Report No. R1433.

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PAINT MANUAL

An up-to-date summary of production facilities and methods used successfully by the protective coatings industry—"Paint and Varnish Production Manual," edited by Verne C. Bidlack and Edgar W. Fasig— was published this month by John Wiley & Sons, 440 Fourth Ave., New York City.

The new volume, sponsored by the Federation of Paint and Varnish Production Clubs, has been designed for the education of production personnel in the manufacture of surface coatings, and for industry executives concerned with the problems of management. A summary of physical facilities—location, plant design, materials handling, equipment, and power— introduces a discussion of the specialized requirements for paint and varnish plants and their various products.

Pointing out that proper control and supervision lead to more economical production, the authors evaluate such plant engineering factors as raw-material estimating, equipment, production planning, inventory keeping, dispatching, and maintenance. Their advice on manufacturing operations covers receiving and storage of raw materials, mixing, tinting, shipping, and other important procedures.

GLIDE FOLDER

The United-Carr Fastener Corporation, Cambridge 42, Mass., has an attractive folder on their various types of glides for furniture. The attractive folder can be opened to form a 24"x24" wall chart for quick reference.

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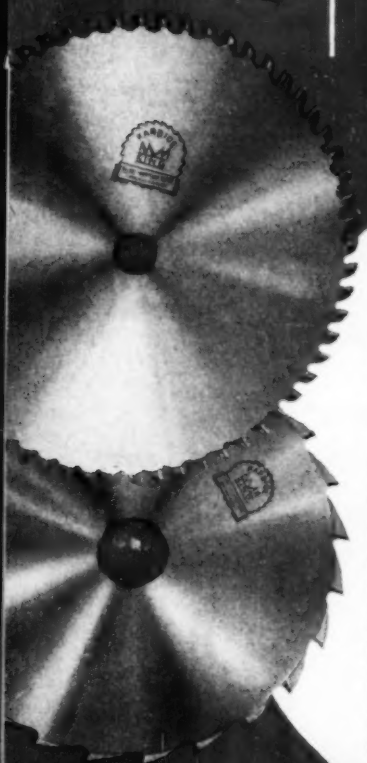

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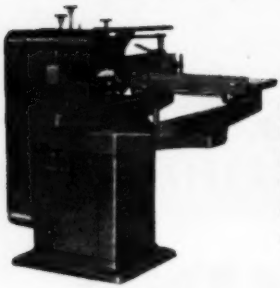

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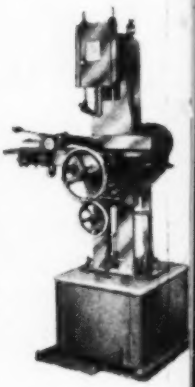

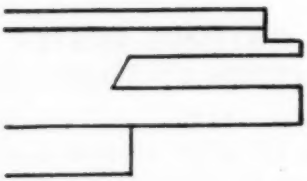

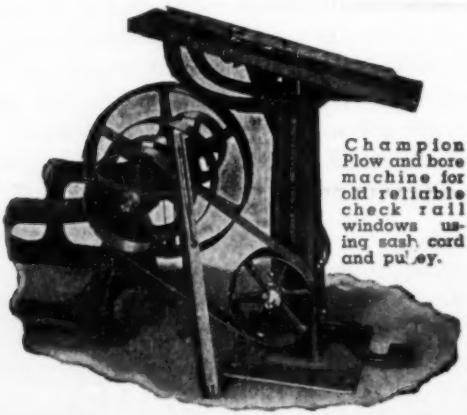

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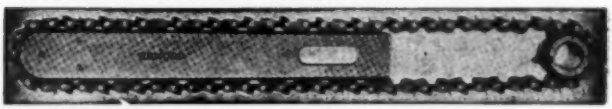

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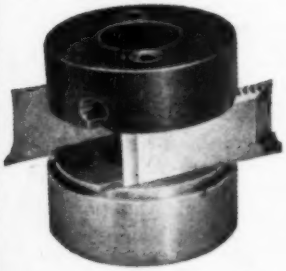

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MOISTURE CONTENT in Relation To *Wood Finishing*

By W. Linton Getz

THIS paper presents certain conditions, existing to some degree in most woodworking plants, which have been found to affect the moisture content of wood and, in so doing, cause developments during and after the finishing process which so often mean rejection of the product by inspectors.

We are confronted today with high speed and large volume production to such a point that we may have overlooked some of the basic principles we learned about wood many years ago. It is because I feel that some of the principles affect the moisture content of wood in the finishing room that they are offered for discussion.

Moisture Content

Moisture content is an old familiar subject with which the great majority of woodworkers are very familiar. Often this same familiarity causes us to become careless.

Numerous experiments in this field have been conducted by forest products laboratories, schools of forestry, and kiln manufacturers, in addition to those conducted by a good many progressive manufacturers of wood products, adhesives and impregnating materials. As a result of these experiments we now have information on how to kiln dry the species used by industry today, as well of knowledge of the correct moisture content of wood to use with the various adhesives on the market to insure good glue joints. We also have considerable information concerning impregnating materials suitable for use in stabilizing and preserving wood.

We have modern plants in which you will generally find the finishing room, if not the entire plant, equipped with air conditioning, thus making possible the maintenance of the temperature and relative humidity best suited for the product being manufactured. Even with this advantage we still experience some of the same difficulties that have plagued us for years, usually to a lesser degree and not as often, but still frequently enough to keep us constantly on guard and interested.

Finishing Room

The control of moisture in the finishing room is very important as we know; and whether a modern setup is available or not, we still must maintain sufficient temperature and low humidity in order not to have trouble with the finishing materials and their application, let alone the wood. Since this is true of the majority of finishing rooms and since the temperature required in the finishing room is invariably as high or higher than any other department in the plant, we should expect shrinkage or contraction and not expansion provided the relative humidity is as

This paper was first presented at a regional meeting of the F.P.R.S. and is reprinted with permission.

low or lower than in the other departments. I find this to be mostly true because the majority of troubles encountered have been due to contraction and not so much to expansion, except for that expansion generally caused by the aqueous solutions used in finishing procedures.

Where the trouble has been due to expansion, it was generally found that the absence of a protective coating on one or more edges or surfaces was a contributing cause. This is one of the old basic principles mentioned earlier. Training the finishers to coat all unseen surfaces first will assist greatly in solving the problem. Even though few customers specify this or even look for it in their inspection, coating of unseen surfaces has been found to pay dividends to the manufacturers in the form of less trouble.

Some woodworkers claim that overall coating is wrong because it seals in the stresses and causes continual movement in such items as flush, plywood, lumber-core cabinet doors. Generally in a door of this type, unless banded on four sides, we find the end grain at top and bottom. We know end grain takes on and gives off moisture easier and quicker than edge or flat grain. Thus, isn't it unwise to leave such a surface unprotected during rubbing operations and shipment? I have been told by manufacturers of fine furniture that they put not one but two coats on all surfaces they can reach with a gun. They consider this good insurance while their furniture is in transit and in warehouses under conditions over which they have no control.

A feeling seems to exist among most woodworkers that it is too late to do much about moisture content of the wood in their product after work has been turned over to the finishing department. However, there are some things we can do in the finishing room that will help to keep the moisture content of the wood stable; and if this moisture content is not excessive, the following suggestions will aid in avoiding trouble.

(A) Proper temperature and relative humidity should be maintained. Temperature alone will not suffice as evidenced by the trouble we experience in humid spells during late spring and early fall. A large number of plants try to maintain a temperature of 70° to 75° Fahrenheit and a relative humidity of 35 to 40 percent. This corresponds to a moisture content of 6 to 7½ percent.

(B) Proper temperature and relative humidity should be maintained over week-ends, holidays, and during the night. Some manufacturers feel that reducing temperature in the plant during such periods is not harmfull and is economical. For the work that is completely finished this may not be too serious; however, a large quantity of work in the white would be affected. Since this work cannot be moved, I would recommend that at least the temperature be kept at a minimum of 65° Fahrenheit during these periods.

(C) If glue sizing is done, it should be carefully controlled and sufficient time allowed for the applied moisture to escape before being temporarily trapped. Since most panels today are bonded with either water resistant or waterproof adhesives, excessive sponging will simply load the thin face veneer with moisture which later will cause trouble. Generally this sponging is done as the last thing in assembly, and where the rate of production is very high, little drying time is allowed. (Because of this fact and the close proximity of this operation to finishing in time and often space, it seems logical that it be included with finishing. In some plants final hand sanding is under the supervision of the finishing foreman.) The

fact that the face of the veneer or whiskers has stiffened sufficiently for sanding does not indicate that all of the moisture absorbed by the veneer in the sizing process has been eliminated.

(D) Intake and exhaust units both in booths and around the finishing department should be kept closed during all long shut-down periods, both for economy and to keep the humidity down. During most of the year this is especially desirable at night and closing the covers only takes each sprayer about thirty seconds.

(E) When using aqueous solutions for wet sanding and rubbing, clean off and dry all work not completely through these operations at quitting time. I know from personal experience that this precaution will help to prevent end checking of face veneer with the resultant lacquer chipping.

(F) Plants not equipped with modern conveyorized drying rooms in their finishing departments wherein outside air is brought in through washers and then heated, may find a few old fashioned heat tunnels, cheaply constructed of light framing and thin plywood or metal with infra-red bulbs as a heat source, useful in removing surface moisture from the white wood prior to staining and again before filling and sealing. These not only remove surface moisture but will give a mild lift to the drying of these materials.

Without any attempt to put the cart before the horse, I have attacked the general conditions in finishing that can affect the control of the moisture content of wood products during their sojurn in the department where we hope all defects will be hidden.

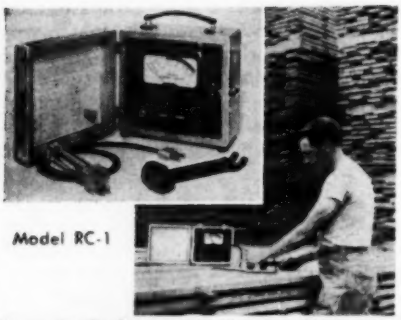
Other Plant Areas

Although the points brought to our attention so far are very important, I by no means think they will cure all our troubles in finishing insofar as moisture content is concerned. We must go further back in our processes and investigate conditions in all departments to determine what need or need not be done to help keep stable the moisture content in the lumber at the time of cutting-out and which, unless kept stable, will cause trouble in finishing and with the finished product.

Experiments conducted twenty-five years ago in a plant which I was associated with as production manager gave us considerable information on other areas in our plant where the moisture content of the wood was changing beyond our belief. At that time this company had been manufacturing fine cabinet work for over fifty years and enjoyed an excellent reputation in architectural cabinet work, store fixtures, bank fixtures, ship paneling and furniture, radio cabinets, and many other wood products we could secure for manufacturing in large quantities.

We had a brand new, single floor, daylight plant that embodied all the good features of our old plant plus some additional ones we thought desirable. Among these were curing rooms for our cores and panels (we made our plywood), as well as drying rooms in our finishing department. We also had large storage areas for work to adjust itself and provide a backlog for operators. In addition, the plant was equipped with an air conditioning and heating system and had an excellent dust collecting system.

Aside from the plant proper there were, of course, a large boiler room, a battery of nine kilns and a conditioned building resembling present day hangars with a capacity of two million feet of kiln-dried stock. All kiln-dried lumber was allowed to temper and then was unpiled, skinned and stacked solid in four foot high packs, each pack made up of one length stock. From this point on all handling of the lumber from the time of unpiling until placed on



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All face mouldings and any items in which twist would be detrimental, because of the length of the pieces, were put through the facer before going to the stickers.

Lumber was dried to 6 percent moisture content and sound wormy chestnut, both flat and edge sawn, was used for core stock. Rotary cut and sliced poplar was used for crossbanding stock, rotary for panels having at least a one-twenty-eighth face and back, and the sliced where we had faces of very thin and delicate veneers. We never two-plied crotches, burls or butts, but we did treat them to prevent breakage. Lumber cores were allowed to cure at least seventy-two hours before going to the rough planer and again before the fine planer. All five-ply panels were made in two operations.

Except for high-frequency heating units, resinous glues, hot presses, and present day machinery, you will no doubt concede that we had the physical equipment that even today would be considered satisfactory for a good plant.

After operating in this plant for a short period we discovered to our dismay and chagrin that we had not only the minor defects appearing in the finished product with which we were well acquainted but, in addition, a new problem known under the technical name of contraction. Joints developed hairline cracks, face veneers had minute checking, and mortise and tenon joints as well as stub tenon joints occasionally showed in the reflection of the finish. An immediate and serious check was made and we discovered that work going into the finishing room had a moisture content of from one to four percent above the moisture content the lumber was supposed to contain on leaving the kiln. This just couldn't be true if the kiln foreman was doing his

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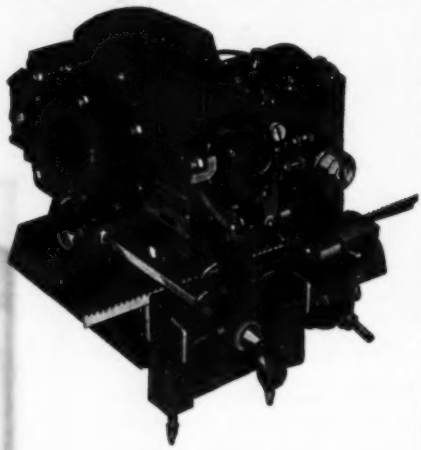

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The result will be quickly noticed in cleaner, faster cutting and longer period of service obtainable from each blade.

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WARDWELL MFG. COMPANY
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Maker of the largest line of saw and tool sharpening machines

job. That's what we thought. However, a month of checking our kiln and kiln loads by both ourselves and outside engineers assured us the lumber was being dried according to specification and we apologized to the kiln foreman. Our tempering shed was next checked, only to find the lumber at the correct moisture content. Finally, calibrated instruments were placed at strategic points around the plant and these were augmented by many wet and dry bulb thermometers. The trouble was quickly located, but in order to be sure we sent through extra material over and above our regular run and made daily checks on this material.

The variation in humidity in the plant was astounding and especially so because of the close proximity of areas with the greatest differences. The highest humidity was discovered in our glue room area. (None of the areas were partitioned with the exception of the finishing room.) The next highest was the veneer room area and we, of course, found wide variations around the outside walls.

Shop temperature was adjusted and readjusted both day and night and many other things too numerous to mention were tried over a period of a year. Fortunately, we had a graduate engineer for our president, who was alert and agressive. Otherwise, we might not have had the initiative to do all the checking that was required. It is generally easy to make one correction and then stop and hope for the best.

We found it necessary to make a number of major changes in order to assure adequate moisture control. Our heating and ventilating system was altered. All pipes on which condensation could form were insulated. Joints along steam lines were kept tight. Foremen supervised opening and closing of the few windows we had. Lumber was kiln dried to between four and five percent

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instead of six percent. Auxiliary unit heaters were placed around the shop at various points. All work having unfinished backs and edges was given a heavy coat of protective material. Plant temperature was kept uniform seven days a week.

Summary

This experience has been related to furnish food for thought. You may find some point in your plant where your lumber is absorbing moisture that may later give you trouble in your finishing. A good many unfavorable conditions in the average woodworking plant can be corrected with very little and some times no capital expenditure at all.

It doesn't do any harm to check up on ourselves now and then just to make sure we don't forget that, even though we are slowly reaching the push-button era, we are still using wood, a product of nature which must be handled carefully and whose actions are sometimes unpredictable and hard to understand even under the very best conditions.

Acknowledgment is made to my present and past associates who have helped me to respect wood and the many problems associated with its conversion into consumer products.

The End

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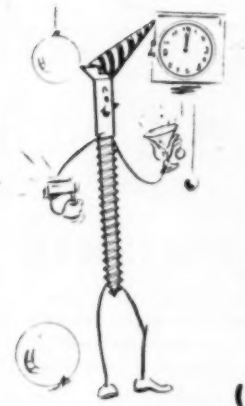
Heston & Anderson Division, St. Paul Foundry & Mfg. Company announce their '52 Model 6" jointer. It has a narrower throat opening, a fence that may be set at an angle across the cutterhead for shearing cutting and for jointing short stock safely. The guard turns under table when rabbeting wide stock and is immediately returned: no adjustments necessary.

Table 60" overall; rabbets ⅝" providing depth cutting often needed. Direct drive model now available. Address Fairfield, Iowa plant for latest bulletin.



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MAHOGANY IN 1952

By George N. Lamb

What will happen in the mahogany industry in 1952? It seems to me that not so long ago it was rather easy to write an "outlook" for the year. Then as the year rolled by, events largely confirmed the story. Now the job seems much more difficult. A year ago our predictions hit the mark except that we did not realize fully that there would be a pile-up of furniture inventories and the slowdown in buying that they would cause during 1951.

We were right in believing that requirements for war production would not hamper furniture production in any serious way in 1951. Even now, it does not appear that war production will be a limiting factor in 1952, certainly not during the first half of the year. Unless the war situation takes a serious turn, furniture production will be adequate for the next twelve months.

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The new Model AF, a fitting companion to the Easy *Electric* Finisher line—a full size, single pad, production air sander! Its genuine *reciprocating* action (*not* orbital) produces the perfect finish without hand clean-up of swirls, etchings or other objectionable abrasive scratches. A water connection for wet work, pads for flat or curved work, make the new Easy Model AF ideal to do your job better . . .

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The main reason for this situation has been that the armed forces have put into effect few wood programs as a means of conserving metal for purposes where only metal can be used. The lag in war production has tended to postpone the necessity of switching to wood programs, although many of them are engineered and ready to go whenever the pressure to maintain the production of civilian goods becomes acute.

The situation in reference to mahogany is a good example. In the last war the call for mahogany was immediate. It was heavily specified in the small boat program and in trainer planes and gliders. Mahogany was frozen for war use. It was a battle all the way to meet military requirements. This time the demand has been quite moderate so far. The plans for 1952 requirements are larger but still will scarcely be a burden to the industry. Only with an all-out war will the demand jump to almost fantastic levels.

It all adds up to just this. If Mr.

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Stalin allows the United States to operate in 1952 according to our plans, war requirements for wood and wood products are unlikely to cause any real shortage in supplies for civilian use. This probably will be the case even though wood production may run into some difficulties later in the year because of shortages in labor, equipment and supplies.

The mahogany outlook ties up rather closely with the prospects of the furniture industry for 1952. The production of television sets also will have an important influence. The men in that industry best qualified to judge the probable volume of next year's production expect that about 4,250,000 sets will be manufactured. That is not far from what will be produced in 1951 when all of the reports are in.

This production will mean more as a market in 1952 than it did in 1951 as television sets were greatly overproduced in the last quarter of 1950 and the first quarter of 1951. This was due

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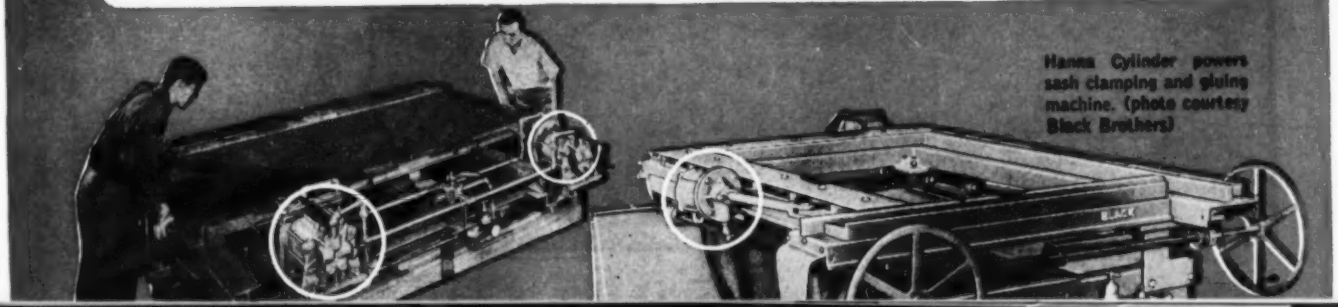
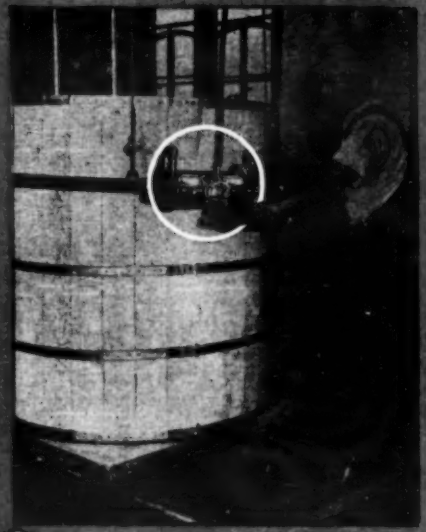


Hanna Cylinder powers sash clamping and gluing machine. (photo courtesy Black Brothers)

Two Hanna Air Cylinders are used here to squeeze reinforcing tubes on panel edges quickly and uniformly.



A Hanna Air Cylinder and Valve serve as a handy power combination (at left) to pull staves together on this collapsible hogshead.

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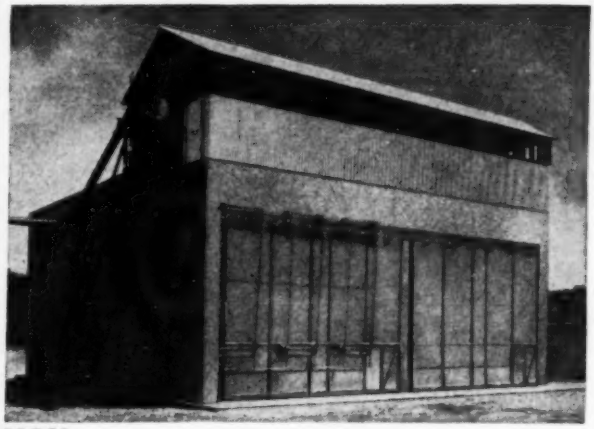

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to a mad scramble to build sets before war requirements interfered. The expected interference did not materialize, so the television industry struggled with excess inventory the rest of the year, with production dropping to very low levels.

Now, excess television inventories are largely liquidated and completely liquidated in good merchandise and by well-established manufacturers in the television field. It has been reported that one large manufacturer already has all television production on allotment for the entire year.

The demand for mahogany for models, mock-ups and foundry patterns will be up during the coming year as the additional supply of machine tools permits increasing production in war goods.

The demand for mahogany for caskets also will be up as inventories of material for metal caskets are consumed and additional supplies are sharply curtailed.

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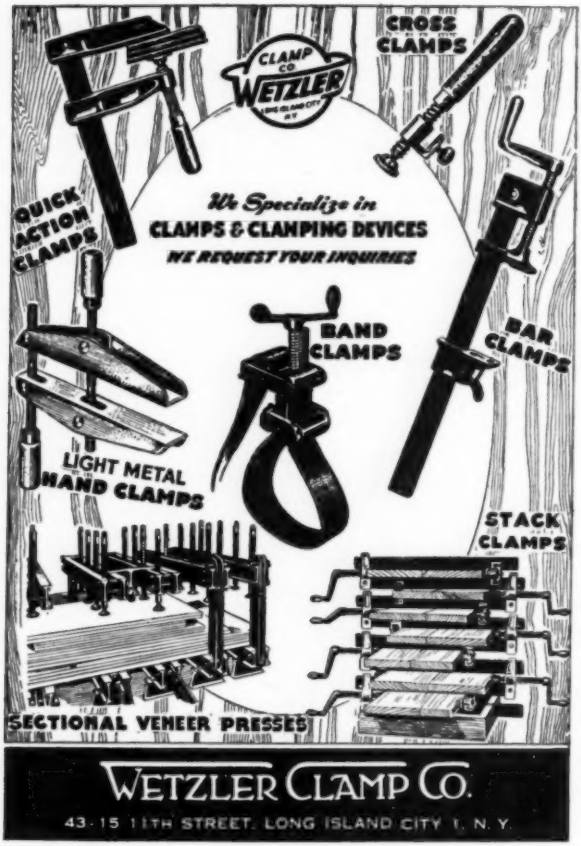
USERS SAY UNION CUTS COSTS — SPEEDS PRODUCTION

As we stated before, the demand for mahogany for furniture depends upon the volume of furniture that will be produced during the year.There always is a lot of shifting about in design and woods in times when demand is less than supply. This is particularly true when productive capacity has been substantially increased during a period of unusual demand. The demand for mahogany, however, continues strong. Comparatively it is fully maintaining its position in the furniture field. This is confirmed by the demand for the Mahogany Association's official labels and tags. The tendency has been for manufacturers to widen lines to include more modern and Provincial design in other woods. The same tendency extends to the retail trade in certain stores or areas.

On the other hand, some manufacturers have extended their mahogany lines and numerous others are using mahogany for the first time. It also is the case that the use of mahogany is being extended in furniture of modern design. This trend is attributed to the fact that modern design emphasizes the use of veneer of the plainer types. In price, mahogany competes very favorably with other woods of this type and at the same time carries a great deal



more prestige and buyer acceptance.

In the case of the furniture industry, the end of World War II released a backlog of demand and a filling of the distribution pipeline that made the current demand appear to be tremendous. Just as the industry was catching up, the Korean situation started a wave of scare buying.

At the present turn of the year, excess inventory has been greatly reduced and with a great many firms, it has been entirely liquidated. This might indicate that the January market will be a big one and back to normal. It will be back to normal but that normal will be without the benefit of the wartime backlog of demand and scare buying, but with substantially increased productive capacity. Reduction in the building of new homes also will be a factor in curtailing demand and the shift toward defense housing will aggravate that curtailment.

In spite of the conditions just cited, a lot of furniture will be made and sold. It will not be surprising if the 1952 volume equals that of 1951. If it is off, the percentage should be small. If this proves true, the demand for mahogany for furniture should be reasonably good.

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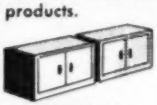
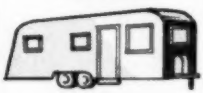
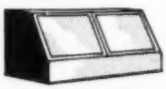


CABINETS



TRAILERS

TOYS



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Features . . . .

Types of Plywood
By Thomas Perry

Veneer & Plywood
By Ned Bailey

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TYPES OF PLYWOOD

Part 4

Douglas Fir as a Structural Plywood

By Thomas D. Perry

Fir plywood is big business. It converts big trees into big sheets of plywood in a big way, and this plywood is used for big structures. It is, without question, the fastest growing branch of the woodworking industry. The key note of its success has been, and still is, vigorous co-operation.

In contrast, hardwood plywood seems puny and the same spirit of co-operation is not apparent. Maybe this contrast can act as a needed stimulant!

IT is rather interesting to note the several marked differences between softwood and hardwood plywood. The differences are much more significant than are any points of resemblance, except that both consist of alternate thin layers of wood glued together in a solid sheet.

Softwood plywood, Douglas fir being the strongly predominant species, is made, almost exclusively, in the coastal area of the Pacific, with minor production in the southern pine areas. Hardwood plywood, on the other hand, is produced by a large number of factories, from eastern Canada to the Gulf coast, and east of the Mississippi river.

Softwood plywood finds its largest field of utilization in the building trades, where its strength and large area provide many structural advantages. Other important uses are in fabricating transportation equipment, such as railroad cars, trucks and boats. Hardwood plywood finds its predominant use in the making of furniture, musical instruments, bank, library and store fixtures and interior trim. In making doors and shipping containers both hardwood and softwood plywood are employed. The major reason for using softwood plywood is usually strength, with appearance as a minor factor. In hardwood plywood these factors are reversed, with beauty and attractiveness taking the lead.

While Douglas fir is used for most of the softwood plywood, hemlock, pine, redwood and other species of conifers, find limited uses in appropriate grades and for certain applications.

Historical Background

While hardwood plywood came into commercial use in about 1875, for perforated and curved public seating, and by 1900 was widely used in many types of furniture and like products, softwood plywood was hardly known before 1905. In that year an enterprising Tacoma operator in Douglas fir, exhibited a few Douglas fir plywood panels at the Lewis & Clark Centennial Exhibition in Portland, Oregon. In the next dozen years progress was rather slow, partly because of inadequate vision, but more because suitable glues were not available that would resist weather exposure. This last limitation was somewhat eased by the commercial availability of casein

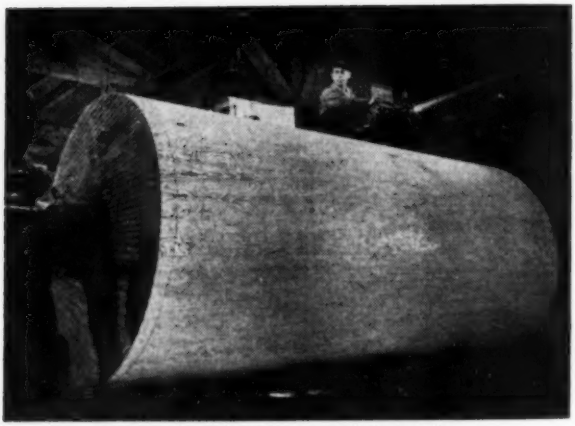

Fig. 1. Peeler logs come big and clear in Douglas fir. Veneer lathe must be sturdy, massive and powerful to cut the veneer.

Courtesy Douglas Fir Plywood Association.

glues about 1915, which had substantial water resistance, as compared with the animal and starch glues that had been in use.

The development of soybean adhesives began about 1925, first with importations from the orient and about 1927, when domestic soybeans became available. Great credit is due to Irving F. Laucks, retired but still living, who pioneered this soybean glue, nursing it from its inception until it became the most important glue in the making of Douglas fir plywood. Soybean glues were in the low cost range and exhibited substantial moisture resistance, although definitely less moisture resistant than the caseins, which, unfortunately, were in a much higher cost range. This availability of soybean glues was almost epoch making and greatly stimulated the production of Douglas fir plywood, since its water resistance made such plywood suitable for many semi-exposed applications.

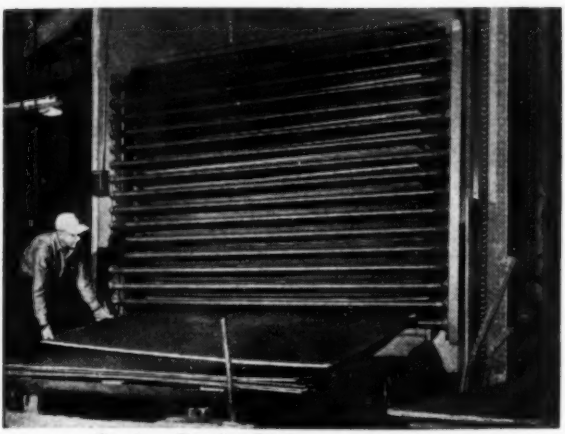

Fig. 2. Unloading a 20-opening hot press producing Douglas fir plywood. Loading rack can be seen at rear center.

Courtesy Douglas Fir Plywood Association.

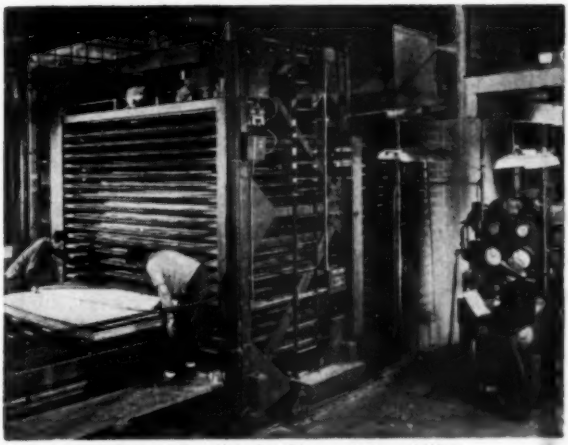

Fig. 3. Unloading a 16-opening hot press, making fir plywood with hardboard faces.

Courtesy Douglas Fir Plywood Association.

While soybean glues were of marked assistance in broadening the useful applications of fir plywood, the advent of phenolic resin adhesives, around 1940, permitted the making of plywood with thoroughly waterproof joints. The adoption of hot pressing materially shortened the bonding cycles and eliminated clumsy clamping equipment. These two features gave much impetus to exterior grades of plywood, since they not only increased productive capacity, but also widened the fields of economic utilization. The fir plywood industry has always been alert and eager to develop and adopt such progressive methods.

The manufacture of hardwood plywood, from about 1925-50, was thoroughly spread out over the eastern area of the United States and Canada, with few large operators, but many furniture factories and the like, operating their own departments to make plywood for their own use on a custom size basis. This hardwood plywood, did not enter the market as such, but was incorporated in the assembled furniture products. Hence the statistics of growth and total production were not and still are not available.

On the other hand, the production of softwood plywood was concentrated on the northwest Pacific Coast, frequently as an adjunct to timber and lumber operations. There was much more community of interest and exchange of ideas than in the hardwood field, where the wide geographic spread discouraged the spirit of working together for a common end. A far more important feature, however, was the fact that softwood plywood was sold as such and its producers became acutely aware of the need of market promotion and took constructive action in that direction. This led to the establishment of standards for grades, sizes and thicknesses.

These standards, first developed by the fir plywood industry under the guidance of the United States Bureau of Standards, were approved on August 17, 1932 and published as a commercial standard, CS-45-33. They were revised repeatedly, and kept fully abreast of the progress of the industry, in 1936, 1938, 1940, 1942, 1945, 1947 and 1948. The basic size is 48 inches wide by 96 inches long, in thicknesses from $\frac{3}{16}$ inch to $1\frac{3}{8}$ inch, with major usage in ¼" 3-ply, ⅜" 3-ply, ⅝" 5-ply and 1" 7-ply. There are also

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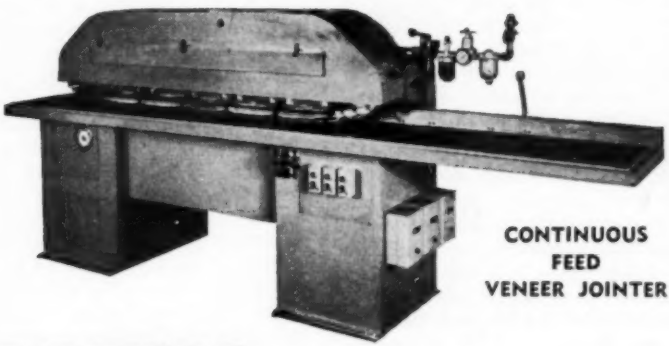
standards for quality, considering both strength and appearance, and for durability, ranging from moderate water resistance for interior applications to complete waterproofness in the exterior types, for maximum weather and marine exposures.

While there had been close cooperation between these neighboring west coast mills, their desire to work together was formalized by the organization of the Douglas Fir Plywood Association in 1938 at Tacoma, Wash., followed by the Plywood Research Association in 1945. These associations have been outstanding in promoting the wider use of plywood, and have been of great assistance in reaching a production total of over two billion square feet (3/8" thickness basis) in 1950, as compared with a mere hundred and fifty million square feet in 1925, a fourteen fold increase.

One of the leading pioneers in the warehousing and marketing of plywood in standard types was Lawrence Ottinger, now at the head of the U. S. Plywood Corporation. He was one of the first to visualize the possibilities of making standard stock panels readily available in large consuming centers and his company has become the largest distributor of plywood in the United States and Canada. Standard hardwood plywood came into the picture later and most warehouses now supply both types. This corporation, since its early start as a warehousing organization, has now acquired its own manufacturing plants, for both softwood and hardwood plywood and still purchases much of its requirements from independent plywood producers.

Making Douglas Fir Plywood

Douglas fir plywood is almost always made in an integrated plant, i.e., the veneers are cut, dried and graded, and also glued into plywood, trimmed, sanded and packaged for shipment in a



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single mill. It is practically all made in standards of 4 by 8 feet, with special sizes up to 6 by 16 feet, and under sizes, by 6 inch steps, to conserve all usable material. Due to this method, Douglas fir veneer is very seldom an article of commerce, and can only be obtained by special arrangements.

This is in contrast with hardwood plywood, some of which is made in stock sizes at integrated factories, but which is more often assembled from purchased hardwood veneers, which are cut to custom sizes and the resulting plywood combined in cabinet or table form, without passing through the open market as plywood. This procedure tends to limit production efficiency, to increase handling and waste, and to lessen the opportunities for maximum economies in manufacture.

Douglas fir logs, as they come from the woods operations, are graded into "peelers" for veneer and saw logs for lumber. The "peeler" logs are selected for soundness, straightness and freedom from knots and other defects. As the demand for plywood has grown during the last few years, the quality standards of veneer logs have been lowered, until the top grade of saw logs has been seriously invaded. As a result the proportional ratios of clear and select plywood are less than they were some years ago. But this has no appreciable effect on the strength qualities, since appearance has been maintained by ingenious repair methods that insert round, oval or wedge shaped plugs, where defects have been cut out, either in the veneer or in the outer layers of the plywood. After sanding, these repairs are difficult to locate without close inspection.

The lathes used in the softwood plywood area must be large enough to "swing" a log 6 feet in diameter and at least 100 inches long, with occasional

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installations of 150 and 200 inch lengths for oversize plywood. As a matter of cutting efficiency, fir logs are usually "barked" with mechanical or steam jet devices, before going to the lathe. This removes the barking operation and much of the "round-up" from the veneer lathe, where it would dull the knives and clog the waste removal conveyors. The logs are lathe cut "cold", i.e., without preliminary cooking or steaming, as is done with most hardwood species. For special requirements, such as thin rotary veneer or sliced veneer for aircraft work, such preparatory treatments are advised. Veneer thicknesses range from 1/12 inch to 3/16 inch, with occasional requirements for 1/16 inch and 1/4 inch. The coarser grain and growth characteristics of Douglas fir do not permit as clean cutting as is obtainable in hardwood, but the required smoothness can be obtained by proper sanding.

Veneers from the lathe pass through the green clipper to be cut either to standard widths, or to have major defects removed. Conveyors take the clipped veneer direct to one of the openings in the drier, usually several decks high and of the roller type, an example is the Coe drier. After deliverly from the drier, with a moisture content as close as practicable to 2%, the veneers are sorted and graded, the whole pieces being reserved for faces, while the part pieces are again clipped to equal the wholes in size. In the case of matched faces, the edges may be jointed and glued, a step not required for inner faces or backs.

It is a distinct advantage to have all layers in a given run, of the same thickness, so that the first selection can be for faces, the second for backs and

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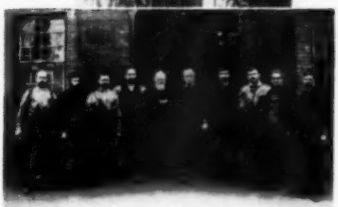

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1952 marks our 100th year as manufacturers of veneer and woodworking machinery.

During this time the plant has grown from a small single structure to more than a score of buildings; while the crew has expanded from 8 men to 250 workers.

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While inventive originality, sound engineering and superior construction of Coe machines have been basic factors, we acknowledge with gratitude the continuing support of our many loyal customers without which the success attained would not have been possible.

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the remainder for the inner layers. This procedure results in higher yields and eliminates much expensive handling.

The adhesives used for maxium waterproofness in exterior and marine grades are hot pressed phenolics. The use of soluble blood extenders, or of casein mixtures, may meet the requirements for concrete form plywood, but are not permitted in the exterior types. Soybean glues may be used for interior and moisture resistant types, usually in hot pressing, to shorten the hardening cycles and to eliminate the need of handling heavy clamped bundles. The hot press cycle may not complete the cure of the adhesive, since this may be accomplished by residual heat in a supplementary "hot stacking" period, immediately after removal from the hot press.

Hot presses may have up to 20 "daylights," and are usually equipped with mechanical loaders and unloaders to eliminate pressing delays. The pressing cycles are short, depending on the curing characteristics of the adhesive and the thickness of the plywood, but are usually of the order of 2 to 3 minutes.

The operations of trimming, inspection and sanding follow, as soon as the plywood has cooled sufficiently for handling. In sanding it is particularly important to equip the sander rolls with progressively finer grits toward the delivery end of the machine. Sandpaper should be sharp and fresh and sanding cuts should be light. Dull paper, too much pressure or too heavy a cut may produce slight depressions in the softer surface areas, which will interfere with final finish coatings.

Some types of fir plywood, as for sheathing, or for other applications where finishing is not required, may be left unsanded. This results in some

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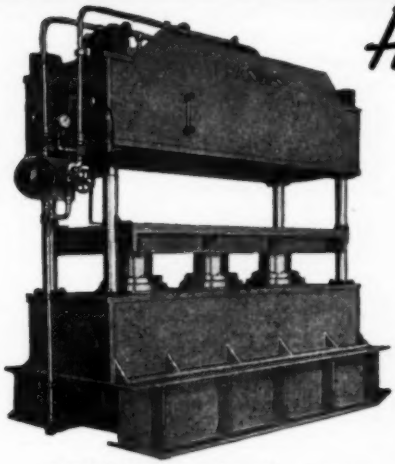

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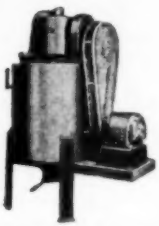

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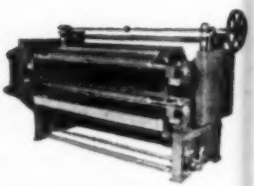

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saving in cost, and slightly increases strength and stiffness, as contrasted with sanded plywood.

Masking the Grain Figure

There are some applications for fir plywood, where it is desirable to mask, or conceal, the grain figure, either to protect the exposed surface from moisture penetration, or to provide for a smooth coating of paint or enamel, which is very difficult on normal sanded surfaces, because of slight unevenness.

Two methods are employed, a surface layer of phenolic impregnated paper, hot pressed on the sanded surface, given a dense but dark colored appearance. The other method is a thin layer of fine sawdust and resin binder, also hot pressed, but on an unsanded surface. This is considerably lighter in color. While either method adds appreciably to the cost, such surface treatment is often justified. Such masking of grain figures may be useful in concrete form work, when smooth surfaces are important, and the reverse imprint of grain figure might be open to objection.

A number of attempts have been made to apply figured hardwood veneer surfaces to fir plywood, such as mahogany and walnut, without much success, since the denser areas of the fir surface, which are higher, tend to show through in any finishing operations. The use of a low density cross band, such as basswood, will be found helpful in equalizing these depressions, where the extra cost is permissible.

Finishing Fir Plywood

The natural grain figure of fir plywood, when selected to avoid "wild" or unmatched effects, can be very attractively finished in large areas, such as wall panelling. The colors may be natural or stained.

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develop shallow and narrow grooving, following the grain direction, which can provide interesting shadow effects, and can emphasize an attractive grain figure.

It should be clearly understood that the use of waterproof adhesive does not protect plywood surfaces from the normal deterioration of wood under exposure, nor from surface checking. The intelligent use of exterior grades of fir plywood demands the application and maintenance of paint or other adequate surface coatings. It is particularly important that all edges be well protected from moisture, since any raw edge will be subject to discoloration, swelling and checking.

Fir plywood for concrete form work is customarily edge and surface coated for surface preservation under repeated use.

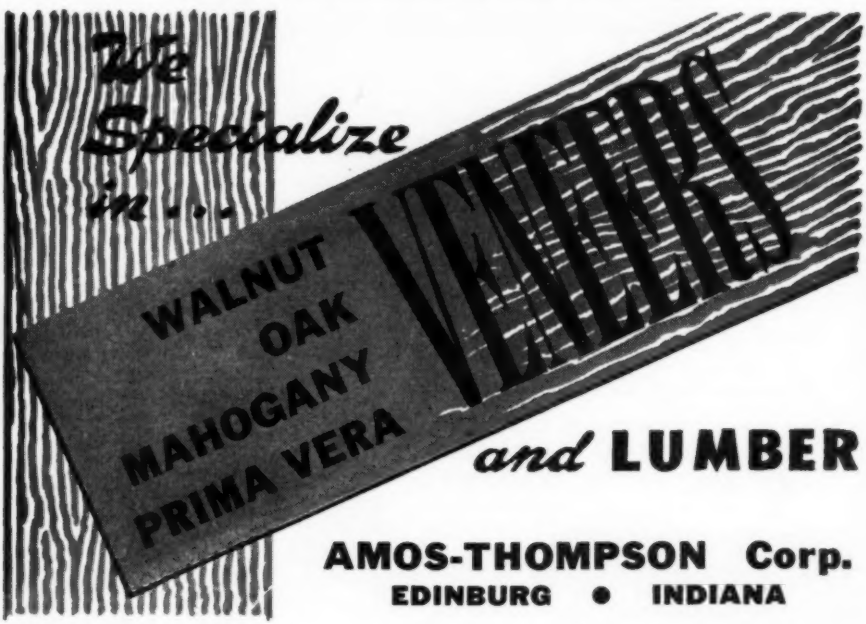
Established Standards

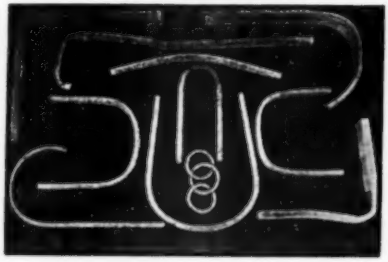
The commercial standard specification previously referred to, CS-45-48, was promulgated by the U. S. Bureau of Standards, and is widely accepted and adopted, both by manufacturers and users. It clearly describes the grades, types and other requirements for fir plywood, and is indispensable to all interested in this industry and its products. Grade marking, certification and inspection have been established, as have tests for adhesive strength, durability and fire resistance.

Conclusions

Since the differences between softwood and hardwood plywood are so marked, a number of comparisons have been outlined, for the benefit of readers who may know one branch better than the other.

The rapid growth and development of Douglas fir plywood, during the last 25 years, has been an outstanding achievement and is a conspicuous example of fruitful industrial co-oper-





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ation. While it is true that the product, introduced some 50 years ago, had latent possibilities, and that it promised to fill a definite structural need, there is a third equally important factor, that of sincere and ungrudging co-operation, which led to the formation of the Douglas Fir Plywood Manufacturers Association. This organization not only gave vigorous leadership to the makers of the plywood, but also supplied the consumers with a wealth of indispensable data.

If the manufacturers of hardwood plywood had been able to co-operate, similarly, under such integrated industrial leadership, their achievements for their industry, would have commanded far greater respect and recognition in the industrial world.

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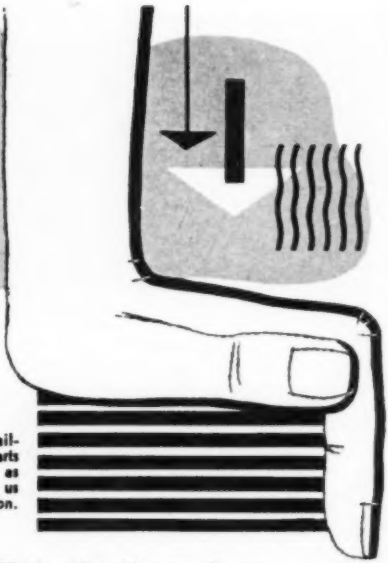

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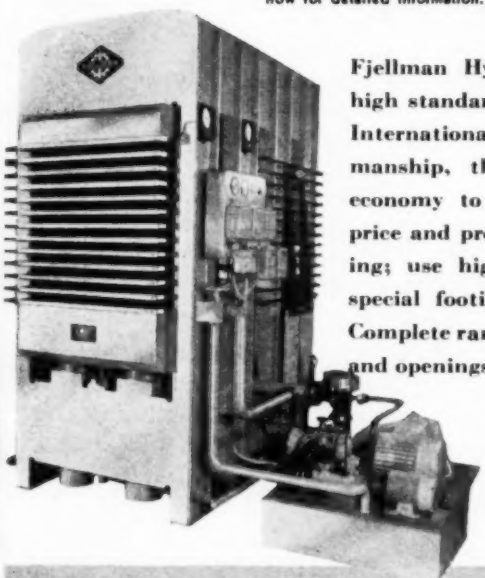

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VENEER and PLYWOOD

By Ned Bailey

Part 16

JANUARY is usually the month we take stock of things with an eye to the future, so I am going to follow custom and do something along the same lines. First let me reiterate what I have often said before in this series of articles. We are only scratching the surface as far as the product and potential uses of veneer and plywood are concerned. This situation is largely due to the remarkably fine work being done by the manufacturers of machinery, adhesives and plastics. In passing I would like to note that some of the materials to treat both veneer and plywood are derived from wood as a by-product and put back into the veneer and plywood in another form.

The old-time fakers who used to cover up poor material with good looking veneer are now only a memory. Today many of the veneers in use are so valuable and beautiful that a manufacturer uses them with his best materials. Then, too, veneers are not always good particularly for commercial plywoods. In the case of plywood today the custom of reducing the quality to get the price down has been reversed, not only in so far as the materials involved are concerned, but modern machinery and methods have made it possible to make better plywood and veneer for less money.

Those of you who use wood-faced plywood for furniture manufacture should visit a veneer manufacturing plant if you possibly can. Learn about how they are made and see some of the many beautiful designs that nature and the manufacturers produce. Dave Webb's, Amos-Thompson's Edinburg, Ind.; Birds Eye Veneer Co., Escanaba, Mich.; Chet Stem at New Albany, Ind., and many others. Incidentally, a number of them have some of the finest display rooms seen anywhere.

Some furniture manufacturers, and we expect more as time goes on, will prefer to buy three-ply panels to be used as stock on which face veneers are glued at the furniture factory. In this way any desired matched effect can be produced as needed. The introduction of small but efficient presses of from one to three panels greatly helps this arrangement.

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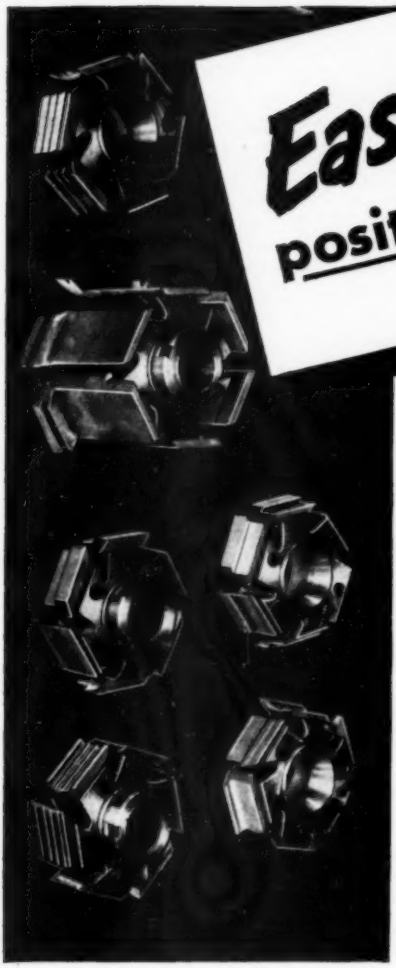
EDINBURG, INDIANA

cabinetwork items made of plywood: table tops, table leaves, case backs, drawer front and bottoms, mirror backs, foot and head panels in beds, radio cabinets, piano cases, sewing machine cabinets, fixtures and seats and backs of auditorium chairs, school and theater chairs and church pews. In fact, plywood is used in all parts of furniture except legs, rungs, frame, rockers and similar solid parts. Cabinetwork such as cupboards, closets, bookcases and medicine chests provides another large outlet for plywood.

The strides made in freight car and truck trailer construction with Unicel plywood are outstanding. The fact that this material can be made in large sizes and has remarkable strength lends it to this type of use. Recently when I was in Houston, Texas, I discussed plans with a manufacturer for building houses of this or a similar material. He was very enthusiastic about the potentialities here. Think of the time-saving features of such a plan and the flexibility of design that would be possible. At that time the company still was not satisfied with the pest and moisture resistance of the materials. I was asked not to mention any names in regard to this new development nor say anything about another plywood product for the building industry that they will bring out in the next few months. We are promised the first release when the news breaks.

It is an unpleasant fact that we must recognize, but war demands seem to be the ones that cause more advancement in many industries than do peace-time necessities. I speak of this because already I have heard whisperings about new veneer, ply- and laminated woods and their uses for the military. It seems to take a war to get back to us some of the markets we used to supply such as in the transportation industry. There is practically no part of the main con-



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• Diehl's complete line of standard cutter heads includes a wide variety of vice grip heads. Diehl vice grip heads are easy to set up, give positive alignment, and have greatest gripping power for retention of dovetail cutters. A few of them are illustrated, both with and without Diehl's self centering sleeve. Diehl vice grip heads are safer and more satisfactory for heavy cuts and high frequency spindle speeds. Diehl heads are rugged . . . they *stay* on the job!

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CUTTER DIVISION

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struction members of vehicles, boats or aircraft that veneer or plywood cannot be used, and will be if they are not already. True there are instances, particularly in aircraft, where one or more of the ply must be of metal such as aluminum.

The hush-hush material, which many of us in the business already know about, may bring us a use for plywood in combination with metal that will broaden the demand for plywood. Some of the many interesting plywood uses of a none-too-well knwn type include, instrument boards, mock-up designs for automobiles and aircraft and kitchen equipment.

Then there are the high density types of plywood for shaping forming dies for thin sheet metal parts, plywood patterns and plwood clips. The rapid development of pressed wood and its adoption for the center ply of many plywood uses has been rapid and interesting. This form of plywood will grow in importance as the manufacturers become better acquainted with its limitations, and the plywood manufacturer realizes that this form of material is here to stay.

To sum up what we look for in improvement and in new design will concern the use of the Unicel type plywoods, plywood combinations with one or more ply of metal, paper, plastic and hardboard. One of the things we have seen that is still in the experimental stage are plywood and cast wood pipes for plumbing purposes. This takes us back to the old Roman waterworks and system of wooden pipe. In our modern adaptation however, plywood and cast wood pipe chemically treated can be used not only for water, but sewage pipe and for chemical plants also.

Yes, plywood usage is still in its infancy. Watch the baby grow in 1952 and read about it in WOOD WORKING DIGEST.

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Keller **PRODUCTS, INC.**
47 Union Street, Manchester, New Hampshire

NEW MILL OPENS

Roddis Plywood Corporation, a leading manufacturer and wholesale distributor of plywood, doors and allied products, has announced the January 2nd opening of a new mill for the cutting of veneers at Sault Ste. Marie, Ontario. Completion of the veneer unit is another step in the company's program of utilizing its extensive Canadian timber reserves as its timber stands in Wisconsin and Michigan approach depletion.

Located immediately adjacent to the Canadian reserves, the new operation will serve principally as a feeder plant for the hardwood plywood and door factory at Marshfield, Wisconsin. Cutting will be confined largely to Birch, although some Maple and other native woods will be processed.

Equipment includes one 64" and two 110" rotary lathes and two Coe Dryers, giving the mill a capacity of 20,000 feet of logs per day. At present there are about thirty employees, but it is expected that this number will eventually be increased to fifty.

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The modern design of the "VB" Press gives you savings in glue, veneer and labor. After-drying storage space is eliminated and the smoother surface of panels produced eliminates sanding and finishing costs. Compactly constructed, the "VB" Press requires no pit; giving the user a wide choice of placement for more efficient production.

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Coe Manufacturing Company Centennial

The year 1952 is significant to the Coe Manufacturing Company of Painesville, Ohio, marking as it does 100 years of operation as manufacturers of woodworking and veneer machinery. Its history records steady development toward dominance despite depressions and a period of serious difficulty.

The company was founded in 1852 by H. H. Coe and Leonard Anderson to build steam engines and sawmill machinery. The business began to prosper but Mr. Coe felt impelled to enter military service at the outbreak of the Civil War.

Upon Coe's return, Leonard Anderson sold his interest to Mr. Fred Wilkes, an engineer, inventor and business man. Mr. Wilkes had operated an iron furnace at Painesville, using iron ore available locally. He is credited with successful research in iron furnaces and was largely responsible for developing the method of using soft coal to smelt iron. For this reason, no doubt, the site of the first plant became known as "Furnace Hill."

For over 20 years Mr. Wilkes contributed to the progress of the company and the improvement in design and manufacture of its machines.

First Veneer Machines

About 1870 Painesville interests turned to the Coe-Wilkes Company for the development of machines to fabricate thin veneer from which to make tapers to light the gas street lamps then coming into widespread use and for the manufacture of toothpicks. The second plant was built on a site later known as "Toothpick Hill."

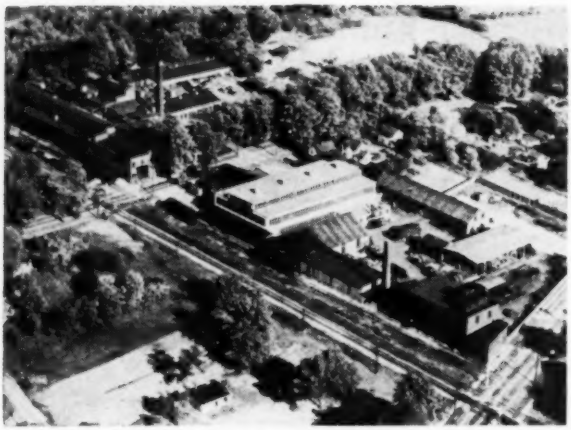
After considerable study and effort a rotary type lathe that successfully cut the thin stock was developed together with a clipper to cut the veneer into the narrow widths required.

The company is still furnishing repair parts for Coe-Wilkes "old style" lathes and clippers. A conservative estimate would place the number of these lathes built prior to 1900 and still in operation at nearly 50.

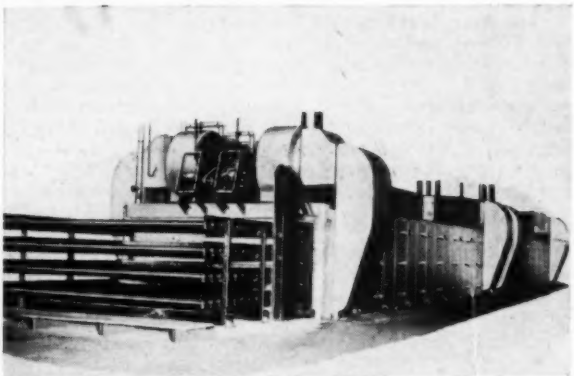
Progress

In addition to his career as a successful manufacturer, Mr. Coe served as mayor of Painesville and treasurer of Lake County. In 1891 he purchased the interest of Mr. Wilkes and was joined

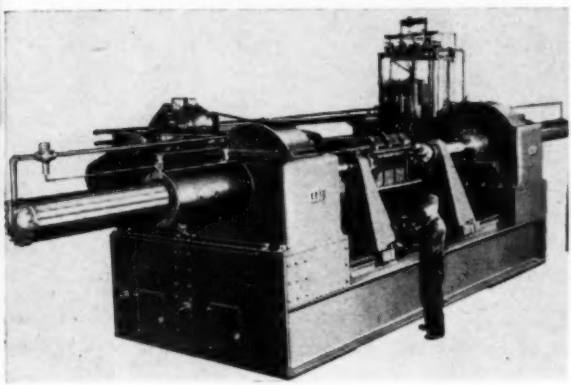
The entire personnel in front of an early plant. Fifth from the left is Fred Wilkes, sixth is H. H. Coe.



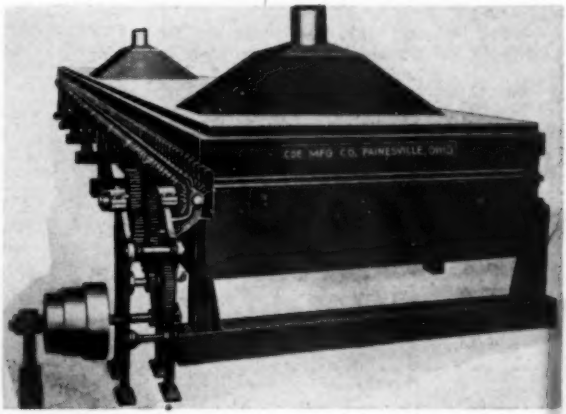
The present plant with modern facilities for 250 employees.



A Coe continuous veneer dryer of present design.



A present day Coe veneer lathe designed to cut the largest logs available.



The first Coe veneer dryer.

by his son, H. P. Coe. The company was then incorporated as the Coe Manufacturing Company.

Another successful decade followed requiring expansion of plant and facilities. In 1901 several acres were purchased on the Nickel Plate Railroad for the third factory. There were built the original buildings of the present group including the machine shop, foundry, boiler plant and the first office now used as the pattern shop.

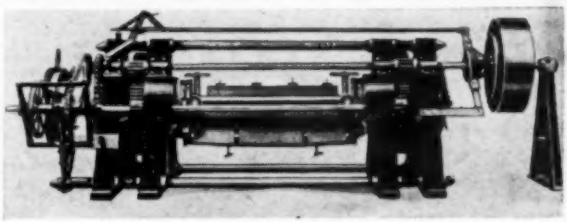
In addition to witnessing gratifying progress which required a modern new plant, Mr. Coe had the satisfaction of seeing his machinery given significant recognition. At the Pan-American Exposition in Buffalo in 1901 the company was awarded a gold medal for its rotary veneer lathe. A similar award was received for the machine at the St. Louis Exposition in 1904. Mr. Coe passed away a few years after this.

Difficult Years

Lacking the inventive ability, inspiration, drive and judgment of the founder, Mr. Coe, and confronted by poor economic conditions, the company suffered badly the next decade which was also a period of serious business depression. A machine important to the industry and to Coe, the roller dryer was developed during this period. In this machine the veneer was moved along between driven rollers as it was dried and delivered in a continuous operation. Years were required to further perfect this dryer and demonstrate its advantages over loft and yard drying which had been practiced heretofore.

While still making veneer lathes, dryers and clippers, the needs of World War I required that all Coe facilities be devoted to the production of shell turning lathes and similar war products. But, although not then apparent, a new and tremendous future lay ahead.

F. W. Milbourn, a graduate engineer and executive of exceptional ability, then general manager of a kindred industry in Tennessee, became interested in the firm. In 1919, after some deliberation, Milbourn was induced to leave his established position and purchase the

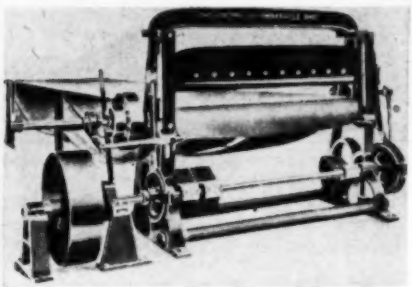


An early model of the Coe rotary lathe.

company assets and also assume the liabilities of which there were many.

The problems that confronted Mr. Milbourn in 1919 were gigantic. The plant, that was so fine in 1901, was now run down after its war contributions. The veneer machines being built had not been improved for some time and extensive redesigning was necessary.

Realizing that experienced engineering personnel was of first importance,



One of the first Coe automatic veneer clippers.

F. W. Milbourn, president of the company since 1919.

Mr. Milbourn began a search for such assistants. Mr. A. J. Vance came from the B. F. Sturtevant Co. to head engineering and development of the roller

F. W. Milbourn, Jr., vice president and general manager.

veneer dryer. To contact the field—south, north, east and west—and render the maximum of service, sales engineers were employed in the persons of F. S. Krag, H. Masters, J. S. Rice, W. R. Teachout and later A. M. Conway.

The new organization began to function with harmony and cooperation. The redesigned and improved machines found ready acceptance and now are in operation wherever veneer is fabricated throughout this continent and in many foreign lands.

World War II

During the years of World War II, due to its facilities and experience in building dryers, the company was able to contribute substantially to the successful development of synthetic rubber.

However, by far its major contribution to the war efforts was the building of veneer machinery to produce plywood for buildings, planes, radio and electric equipment, boats, containers and innumerable other items. The uses of this versatile material seem limited only to the imagination and ingenuity of architects, inventors, designers and craftsmen.

In looking back to the first small shop with 8 employees to the present

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facilities where 250 are employed, the company can rightfully feel some pride of accomplishments. And they have due reason to be especially grateful for the acceptance of their products expressed in a volume of business that has on several occasions exceeded $5,000,000 annually.

FINISHING SANDER

Porter-Cable Machine Co., Syracuse 8, N. Y., describes their new Guild finishing sander in a 2-page circular. The sander is lightweight, orbital motion, run by a powerful universal AC-DC motor. The design of the 106 is based on a simple belt-drive, eliminating gears.

The sanding pad moves in a ¼" orbit covering large areas quickly. It can be used for coarse, medium or fine sanding, rubbing and polishing, the manufacturer states. The circular illustrates the sander and gives complete specifications.

CUTTER GRINDER BULLETIN

Dependable Machine Company, Inc., of Greensboro, North Carolina, announce the release of Bulletin C-7.

This bulletin pictures and describes the new Dependable 106-A universal cutter head grinder. This machine has a ball bearing table which, according to the manufacturer, due to its ease of operation should greatly reduce the fatigue of the operator. All adjustments are conveniently located. This machine is equipped with improved models of the G-10 and G-10a cutter head setting gauges. The 106-A is designed for heavy duty grinding having a capacity of 12" diameter by 15" long for side heads, moulder or profiler heads and will grind thick and thin knives up to 20" long.

More and more husbands are buying the meat these days. They can't trust their wives to go shopping with that much money.

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CHALLENGE TO PREFAB HOME BUILDERS

America will need about 14½ million homes in the next 10 years, according to a housing research expert.

Dr. Richard U. Ratcliff, former director of housing research for the Housing and Home Finance Agency, Washington, D. C., made that estimate in a speech before a recent meeting of Prefabricated Home Manufacturers' Institute.

Dr. Ratcliff, now professor of land economics at the University of Wisconsin, explained that an average of 700,000 new dwellings must be built annually to house new families and replace units destroyed by fire and disaster. An additional 750,000 homes will be needed each year to replace temporary and substandard housing.

The amount of housing needed is a challenge to the construction industry, he declared, and especially to prefabri-

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GRAND RAPIDS, MICHIGAN

cated home builders. That industry, he added, must lead the way in reducing building costs.

Material shortages and credit controls will limit housing production in 1952 and probably 1953, Dr. Ratcliff continued, but he predicted a large amount will be permitted for military and defense workers.

He conservatively estimated the combined needs for these two groups to be 400,000 houses a year for two years. He pointed out this volume would represent nearly half the housing goal for 1952, which the HHFA administrator has said is still in the 800,000 to 900,000 range, but he expressed doubt that nearly that much emergency housing would actually be accomplished per year for 1952 and 1953.

In the long run, Dr. Ratcliff was optimistic that a "big bite" can be taken into the replacement market of 7 million or more houses during the next decade.

He contended that since Americans are "house-conscious" they have a strong urge to better their living conditions.

"This universal push toward ever-higher standards of living probably will account for far more replacement of low-quality housing than can the direct attack through slum clearance, if for no other reason than the immense costs involved in such projects," he explained.

Stating the prefabrication industry is "in the main flow of the industrial revolution" now taking place in the housing field, Dr. Ratcliff urged prefabricators to serve all classes of housing demand with a better product at a lower cost.

"In the past 10 years," he said, "the prefab industry has broken through many of the road blocks of inertia, consumer repugnance, building code barriers and labor union reluctance. The road ahead has chuckholes and detours, but the speed with which the industry travels toward its goal will largely depend on further developments in industrial organization and business methods which evolve out of the unique requirements of factory-building of

houses and which represent an integration of the processes of production, financing and distribution.

"There is no apparent reason why the inherent advantages of prefabrication cannot lead the industry to a position of dominance in home building—in 10 years to the producing of half the homes built; in 20 years—two-thirds, and perhaps most important of all, to a better-housed America, in finer, more adequate homes at a lower cost."

STRAPPED CORRUGATED CUTS PACKAGING COSTS

Packaging costs at the Inglewood, California plant of L. H. Eubank & Son, manufacturers of built-in ironing boards, were recently reduced 87 percent by the use of an improved lightweight corrugated container and the installation of a fast steel strapping setup.

This company formerly shipped their wall-type ironing board units singly in heavy one-piece corrugated cartons. They are now shipping them, two at a time, in steel strapped packages made of four pieces of lightweight, low-cost corrugated board. The resultant saving is 35¢ per unit shipped, we are told.

Packaging of the units is now accomplished at individual strapping stations. Each station is equipped with a small wooden assembly bench, two overhead-mounted Acme Steelstrap coils and a semi-automatic Acme Steelstrapper. Continuous lengths of ½-in. steelstrap are looped around the overhanding ends of the bundles and then quickly tightened, sealed, and cut with a single stroke of each of two handles of the strapper.

When both straps have been applied, the bundles are tiered in the warehouse on wooden skid-type platforms and later transported by saddle truck to box cars for a damage-free trip to customers. Because of the resultant lower tare-weight charges, substantial shipping savings have been realized. In addition, considerably less warehouse space is now needed for the storage of packaging materials.

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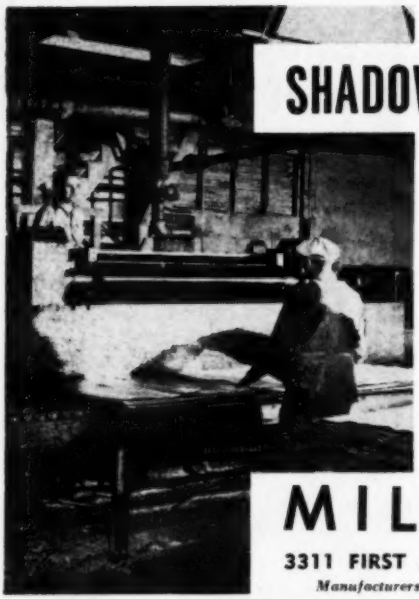

SHADOW LINE GUIDE No. 2

Widely used at the glue spreader wherever plywood is made — for detecting undersize pieces; also used on fish tail saws and in all trimming and edging operations. Shadow line guides are also available for many sawmill operations—edging, ripsawing, trimming.

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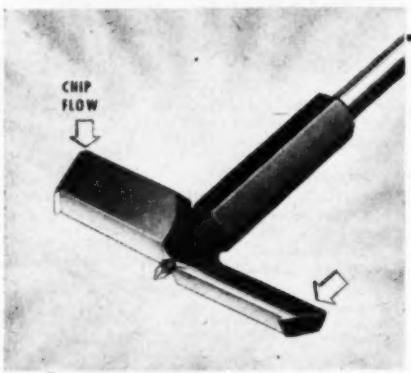

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FURNITURE PACKAGING AND DAMAGE

By R. E. L. Harmon

FURNITURE is one of the commodities frequently involved in damage, the styling and construction with its periodic revision materially affecting its transportation characteristics and susceptability to damage. The tremendous waste of resources, materials, labor and investment with resultant economic loss involved in damage stresses the importance of liquidating this liability. Basically, there is a definite cause for any damage. Packaging and handling are two important factors closely related to safe transportation. Adequate packaging is the prime ingredient of good performance. An article properly packaged at the source has been started a long way toward its safe delivery.

The constant change of style design and construction of most articles often require an individual approach to particular packaging. For example, an article of one design successfully packaged, redesigned with perhaps only a slight change of construction could require an entire re-arrangement of inner packing to insure the utmost in packing performance.

The extent of furniture damage in the past has necessitated the present specific packing requirements mandatory for all shipments subject to the Consolidated Freight classification. Numerous packages covering a variety of alternative methods of container construction and inner packing are authorized for individual articles. Since its inception, the specific packaging of furniture has yielded dividends in the extensive reduction of freight damage claims.

It should be borne in mind that packaging requirements are minimum specifications, especially true concerning articles of furniture for which it is impossible and impractical to provide detailed requirements for the packaging of each style or design of an article. The majority of manufacturers recognize the basic principles of packing a particular article and so prepare for transportation, often exceeding minimum packing requirements.

Many articles of furniture may be prepared in various types of fibreboard packages with present latitude of specifications permitting a wide variety of container construction. Some containers are of exceptional quality, others requiring only a slight change of container assembly could be improved immeasurably.

Often a sample package for a particular article is properly designed by the supplier of packing material with frequently the inner packing being improperly assembled by the packing forces of the manufacturer, invariably through inversion of suspension or clearance forms, materially affecting supporting strength or maintenance of form assembly. A few manufacturers have retained original samples for review by packing forces or positive instruction of new employees. Packaging should be subject to the same supervision as any production phase of the article, especially when packing forces operate on a piece-work basis.

We all know of articles possessing certain characteristics of such material that could not be damaged regardless of how packaged or handled. It is known

that any article can be designed and prepared for shipment in such a manner that its safe delivery can be guaranteed. On the other hand, numerous articles can be so poorly packaged as to involve nearly all in damage. The expense of packaging with its relationship to selling price must always be recognized, although it should never be considered as something extra, but an integral part of production and delivery cost.

A great deal of attention is devoted to articles of furniture involved in extensive or repeated damage, due not necessarily to violation of packing requirements, but generally due to improper package assembly. Correction is often accomplished with only a small change of packing and without additional expense.

The prevention of damage, involves full consideration of all the elements which could possibly contribute or share in the result. The basic characteristics of the article must be determined, its susceptibility to damage as a whole or to certain sections, exact method of packing and stowing. Also the examination of inherent properties, occasionally revealing a defect in manufacture.

The ultimate goal of a manufacturer, shipper, carrier and consignee is to package, ship, transport and receive merchandise without damage. The achievement of this goal is not easy. The complexities of transportation, coincident with packaging, handling and the ever present human element develop obstacles difficult to surmount.

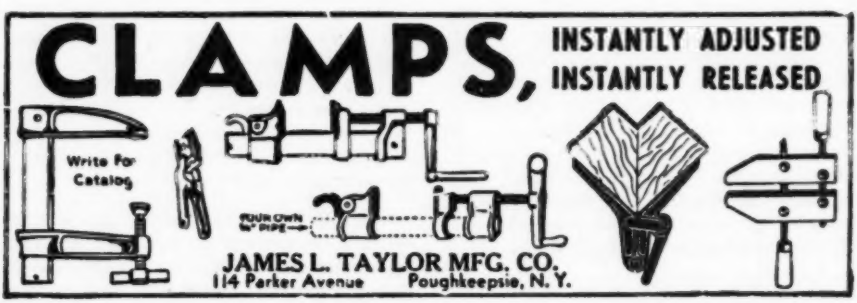
The carriers in accepting their share of responsibility for safe delivery realize the value in the education of their handling forces and this program is constant and ever expanded. They are familiarized with characteristics of furniture, susceptibility to damage and the importance of handling and stowing, so essential in the prevention of damage.

A REVIEW OF ELECTRICAL PROPERTIES OF WOOD, by John M. Yavorsky. Published by State University of New York, College of Forestry, Syracuse 10, N. Y. 27 pages. Illustrated. $.30.

Development of electrical meters for measuring wood's moisture content, and of radio frequency heat generators for wood gluing, has created a demand for a more thorough knowledge of wood's electrical properties. Besides their industrial connotations, these properties are useful scientific tools in determining wood's ultimate structure.

An evaluation of these electrical properties by John M. Yavorsky, research assistant in wood gluing studies has been published. The review was written in 1948 for use within the college at the outset of a series of wood gluing studies. It has now been released as a public service.

Yavorsky examined wood's dielectric



constant, dielectric loss factor, conductivity, and power factor on a basis of the underlying electrical theories involved. His review discusses variations in each property caused by frequency, temperature, moisture content, density, and direction of grain.

The 27-page book contains 15 diagrams which demonstrate these variations in the four electrical properties studied. Supporting data was obtained from 25 technical sources.

PLANER AND MATCHER

The S. A. Woods Machine Co., Boston 27, Mass., describes their No. 412 series planer and matcher in an 8-page folder. The machines and its parts are illustrated and specifications listed.

Here are some of the advantages claimed by the manufacturer: feeding mechanism is simply designed yet rugged and quick acting; roll tensioning and hoisting mechanism for feed-in and feed-out rolls has been simplified; push button control is conveniently located for each motor; uniform tension maintained on belts by patented binder construction; bottom roll adjusts simultaneously with platen; all ball and roller bearings housed in dustproof housing; profiler designed to give full accessibility for setting heads and knives.

WALT'S WORKSHOP

This book, published by Popular Homecraft, 154 E. Erie St., Chicago, features 42 specially prepared how-to-make-it projects for the woodworking hobbyist and the home owner. The book is 144 pages and has many photographs and working diagrams.

Walt Durbahn is an industrial art instructor and a two-time winner of television's award for the "best education and how-to-do-it show."

Projects described in the book vary from picture framing to playground equipment. Each one explained and illustrated in detail.

ARE YOU LOSING MONEY FROM DUST?

One of many dual-clone dust control systems installed for Curtis Companies, Inc., large millworking firm.

LET DAY DUST CONTROL PROVIDE THE ANSWER

A DAY dust control system engineered for your plant will answer all your dust problems . . . will stop dust losses and speed up production. Many woodworking plants discovered that DAY dust control reduced plant maintenance time . . . kept machine production time high, and improved working conditions, which increased plant output. Fire hazards were reduced and the neighborhood dust nuisance eliminated. In selecting DAY, these plants benefited from 70 years experience of the DAY Company in engineering, manufacturing, installing of dust control systems in woodworking plants.

WRITE FOR BULLETIN #49

The DAY Company

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IN CANADA: P. O. Box 70X, Fort William, Ontario.

Branch Plants in Fort Worth, Buffalo and Welland, Ont.

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HAROLD H. SWIFT
Chairman of the Board, Swift & Co., Inc.

"I know of no savings plan better suited to individuals than buying U. S. Government Bonds through the payroll deduction plan. Systematic saving in this manner is an excellent way to produce a backlog of security for future need."

Let's take a look at the Payroll Savings Plan.

Introduced in 1941—and quickly taken up by industry—Payroll Savings offered employed men and women an opportunity to build for individual and national security through systematic savings in *U. S. Defense Bonds.*

During the war years, Americans continued to save—and helped to finance a large part of the cost of the war—by Payroll purchases of *U. S. War Bonds.*

In the post-war period of adjustment, billions of dollars in bonds provided an economic cushion new to this or any nation. Inflation would have been a far more serious problem had these billions of dollars been used for competitive spending. Since VJ Day, men and women have continued to build security through easy, systematic Payroll purchases of *U. S. Savings Bonds.* Today, Americans hold more than 56 billion dollars in U. S. Defense, War and Savings Bonds, a figure higher than that held on VJ Day.

Beginning in November, 1950, thousands of companies revitalized their payroll savings plans. Through a simple person-to-person canvass among employees—without pressure or emotional appeal—more than a million workers have joined the Payroll Savings Plan or increased their monthly investment.

Phone, wire or write to *Defense Bond Division,* U. S. Treasury Department, Washington, D. C. Your State Director is ready to help you build your Payroll Savings Plan.

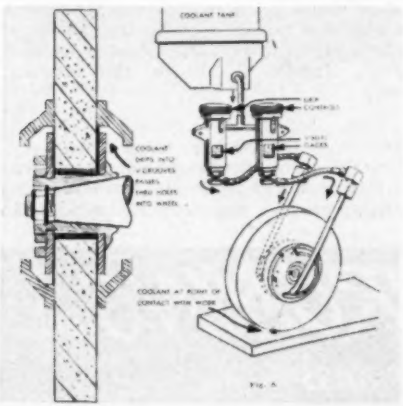
The U. S. Government does not pay for this advertising. The Treasury Department thanks, for their patriotic donation, the Advertising Council and

WOOD WORKING DIGEST

222 E. Willow Ave. **Wheaton, Illinois**

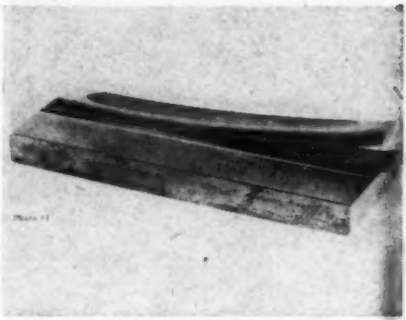
NEW GRINDING TECHNIQUE

Much has been written on the subject of physical damage which occurs when tools are improperly ground. Usually, this damage consists of cracking and/or "skin" softening. Almost always, this damage cannot be seen with the naked eye, and requires laboratory inspection such as Rockwell, Magna-Flux and acid-etch tests in order to determine the extent of harm done. Many tools may have near-perfect finish, dimension and flatness, when given a visual inspection, but may actually be so abused in the grinding process as to be of little or no value in actual operation.



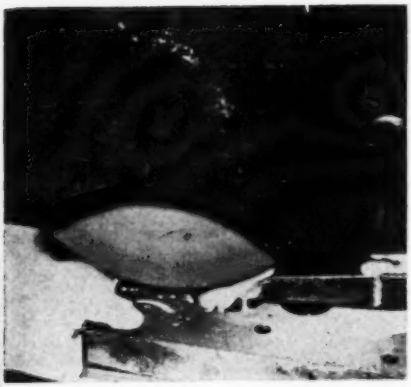
In every case, all of the damage is caused by one factor—too much heat generated between the grinding wheel and the piece of work.

Minute surface cracks can be caused, so tiny that they cannot be seen. However, they provide a good starting point which may eventually grow until a die or other tool actually breaks into two or more parts while in use. Sometimes the breakage might even occur when the die is at rest on a shelf. In some cases the breakage happens immediately, as any grinder hand can attest who has had the experience of grinding a die, removing it from the grinder and finding to his surprise that while he placed only one piece on the chuck, there are now two pieces.



The other type of damage, "skin softness," is not so easily noticed, but can be just as costly. In every case, the steel selected for any tool is selected according to its various properties for any particular job. The metallurgist has provided a suitable alloy, and the heat-treater has carefully brought this alloy to exactly the proper hardness and toughness to withstand the shock, heat, strains and stresses to which it is to be subjected. However, all of this skill may be lost through improper grinding, for too much heat can and usually does soften the surface to a depth which can go as far into the material as .030". Naturally, a soft cutting edge is a poor one, for it rapidly becomes dull and needs resharpening. Unless it is badly burned, you cannot "see" a soft surface, but the constant delays for resharpening can easily be seen in the profit-and-loss statement.

Grinding damage, since it is rarely seen or recognized, is an insidious factor which wastes many hundreds of thousands of dollars and man-hours. Occasionally it erupts into full view, as for instance in photo No. 1, which is a six inch piece of 52-100 steel, hardened to 65 Rockwell C. The front half of this piece was ground using recommended speeds and feeds and using DoAll's new "Cool Grinding" (U. S. Patent No. 2470350) technique to keep the work cool. In this system the coolant is forced directly through the wheel, from inside out, making sure that each



cutting particle in the wheel is provided with coolant.

The back side of this piece was ground dry, using a fast table speed and taking a very heavy cut. In doing so, a great amount of heat was generated, the result of which is easily apparent. However, there is no basic difference between this crack and the ordinary minute surface cracks ordinarily found wherever work is improperly ground. This example of grinding damage occurred in the DoAll Company experimental laboratory during comparative tests of various types of coolant systems, and also grinding without coolant.

Since it is heat which causes practically all grinding difficulties, then anything which will reduce grinding temperatures is certain to provide better results. The ordinary way to do this is to pump a coolant solution onto the work piece while it is being ground. This serves the purpose of carrying away some of the heat, but in most cases there is no coolant at the point where it is needed—under the grinding wheel—for the air blast created by the wheel (photo 2) keeps the coolant away.

With DoAll's new "Cool Grinding" technique the coolant is said to carry directly through the wheel, as shown in figure A and photo No. 3 where each cutting particle is thoroughly saturated.

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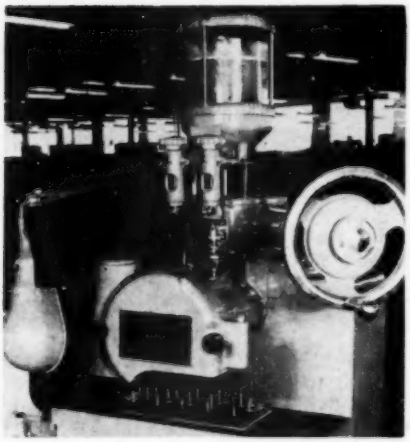

In grinding, increased production and longer tool life are obtained if the cutting tools are cooled. Each abrasive grain is an individual tool such as the bit in a production lathe, and if it receives a constant flow of coolant, it cuts faster, lasts longer, and produces a better surface. In feeding the coolant through the wheel, centrifugal force provides the power, atomizing the solution and flushing the wheel to prevent loading and glazing. A further benefit is realized in that the work is 100% visible.

"Cool Grinding" requires no special wheels, all of the ordinary vitreous-bonded wheels being sufficiently porous to permit the flow of coolant. This new technique is a proven advantage over ordinary coolant systems, and especially so in the grinding of the new hard and tough alloys. It must be remembered that the improved alloys for tools are necessarily difficult to grind, for it is their ability to withstand abrasion which makes them good tools.

"If it was wise, manly and patriotic for us to establish a free government, it is equally wise to attend to the necessary means of its preservation."

—James Monroe.

WOODWORKERS SAY:

"Durham's Rock-Hard Water Putty covers up Nature's mistakes as well as our own. It handles beautifully — finishes smooth as velvet."

Durham's Water Putty has great strength and adhesion. This modern plastic fills knotholes or cracks, replaces chips, fills and smooths off edges of plywood, etc. *Absolutely does not shrink.* Comes in 25, 50 and 100-pound drums in powder form—keeps indefinitely. Mix with water as needed. Send now for free sample and prices.

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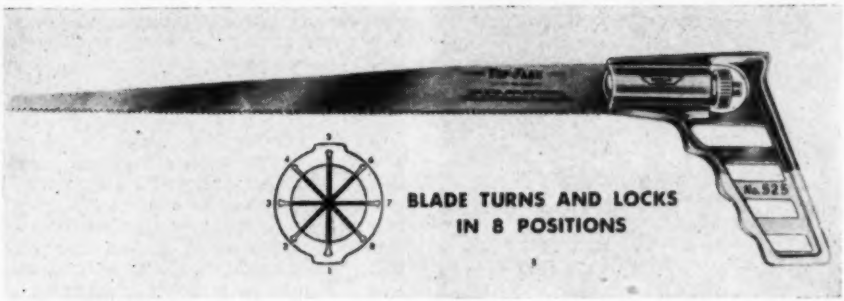
THE MODERN PLASTIC REPAIR-MATERIAL IN POWDER FORM

ROTATABLE BLADE KEYHOLE SAW



"Cuts most anything — most anywhere!" Under this slogan, Millers Falls Company of Greenfield, Mass., introduces a new rotatable blade No. 525 Keyhole Saw, a highly useful and inexpensive tool. It cuts wood, steel, iron, plaster, plastics, nails, bolts, metal lath, asbestos shingles, non-ferrous metals, fibre board, hard rubber, plywood and many other materials fast and efficiently.

Countless jobs that are difficult or impossible with regular saws can be performed quickly and easily. The tapered 11¼" blade reaches into tight places, curves and corners where hack saw frames and standard wood saws can't be used. And because the blade turns and locks in any one of 8 positions, the handle is always in the clear for fast work without danger of skinned knuckles.

Standard equipment includes a 10-tooth-to-the-inch "Tuf-Flex" blade of special patented hack saw alloy steel, heat treated to produce a hard, tough but flexible blade. Easily interchangeable, special purpose blades are also available.

WOOD GOES TO SEA

The 85-foot cruiser Westlake, launched recently by Stephens Brothers, Inc., Stockton, California, is the largest pleasure boat built on the West Coast in 25 years.

Beam of the Westlake is 18', draft, 5'. Cabin sides are of polished Honduras mahogany, decks of teak. Cabin tops are molded plywood, canvas covered. Inside planking is of fir. The pilot house has matched walnut interior finish.

On deck the Westlake will carry a 14-foot in-board launch for ship to shore travel. Navigation equipment includes ship to shore telephone, radio direction-finder, fathometer, depth-finder and automatic pilot.

The main salon includes a built-in bar, complete with ice cube freezer and storage space, radio and television sets, movie projector and air-conditioning.

"Yep, it's another rush order."

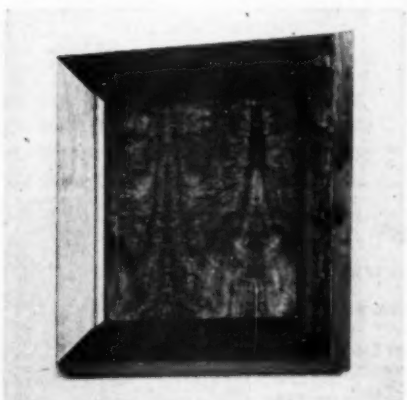
AMERICAN WALNUT

Used to Remodel Furniture Club Dining Room

With its richly figured panelling in luxurious American walnut, and spacious picture windows overlooking Chicago's famous lakefront skyline, the newly remodelled dining room of the Furniture Club of America on the 17th floor of the American Furniture Mart is acclaimed as one of the country's most picturesque club rooms.

The completion of the new dining room, designed by Chicago architect, Philip West, climaxes the remodelling program which marks a complete change-over from the original quarters opened in January 1925.

On the north wall of the room ,facing the glass facade of picture windows, there is a huge "quilted" American walnut panel which provides an impressive background for speakers' tables or an orchestra. The border area of this gigantic panel is made of slip-matched, watery grained figured half-round American walnut, produced by Curry-Miller Veneers, Inc., of Indianapolis. The center area of the panel,



One of the 10 matched veneer panels, featured different cabinetwoods in solid walnut shadow box frame.

Central show piece of dining room is this enormous panel of richly figured American walnut. Cashier's desk and service counter are of the same figured wood.

which is approximately 10 feet high by 20 feet wide, is made up of a rare freak type of rotarycut walnut furnished by Penrod, Jurden & Clark Company of Kansas City, Missouri.

The choice sliced walnut veneers on wall pilasters on the south side of the room as well as on the east wall were furnished by Hoosier Veneer Company, Indianapolis, Indiana. The plywood panels for the pilasters, east wall and center panel were made by Roddis Plywood Corporation, Marshfield, Wisconsin.

Flanking the great center panel on the north wall are ten matched veneer panels of rare and exotic cabinetwoods. Each is displayed in illuminated shadow-box frame of solid walnut. These panels were carefully selected for their beautiful and unusual figure and were contributed to the new club dining room by the following veneer producers:

Tamo, cherry and satinwood panels from Penrod, Jurden & Clark Com-

pany, Norfolk, Virginia; Birdseye maple panel from Birds Eye Veneer Company, Escanaba, Michigan; avodire panel from Theising Veneer Company, Indianapolis, Indiana; figured white oak panel from National Veneer & Lumber Company, Seymour, Indiana; claro walnut panel from the Dean Company, Chicago, Illinois; walnut panel from Evansville Veneer & Lumber Company, Evansville, Indiana; mahogany crotch and sassafras burl panels from E. M. Cummings, New Albany, Indiana.

The entire room is wainscoted in cathedral-matched striped American walnut. This strikingly beautiful pattern was achieved by book matching the flared ends of quartered walnut. Selection and matching was done by the Evansville Veneer & Lumber Company. The plywood panels for the wainscoting and radiator enclosures were laid by the Memphis Plywood Company.

The extensive use of American walnut throughout the room was considered especially appropriate here at the very heart of the furniture industry, because it is today, as in the past, one of America's favorite hardwoods, and widely used in the making of fine furniture.

All of the walnut figure types used and displayed in the room were selected by architect, Phil West, in collaboration with Burdett Green, secretary-manager of the American Walnut Manufacturers Association, whose members contributed so generously to its completion.

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Switch to DETROIT "TAC" RAGS and avoid rejects. Remove all dust, lint and sand quickly, efficiently. The standard for 17 years. Order from your supplier today, or send for sample.

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DETROIT "HANDY TAC" RAG

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DUSTKOPS
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20 Models
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For: Grinders, buffers, polishers, woodworking, lint . . . All Dusts.

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• Fast - Positive - Lightweight • Tough Aluminum Alloy Jaws
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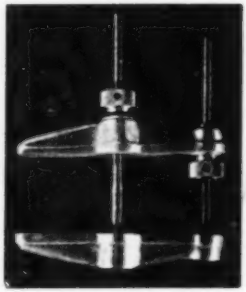
Grips The Work Straight - Like A Vise - Without Side Slipping
One of the most efficient clamps ever devised for Strength, Holding Power, Capacity, Quick and Easy Operation. Try them, you'll want more—low price.
$3.50 per clamp
Dealers Desired



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IMPROVED Ball Bearing Shaper Collars

Friction between collar and pattern entirely eliminated — no more burning.

Outer rim is independent of the slotted collar and revolves with the feed of the work.

Collars can also be supplied without grooves for use with solid steel cutters.

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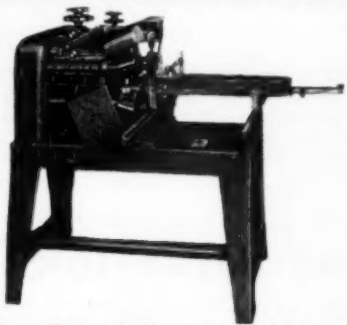
DELUXE FLOOR MODEL TENONER



New adjustment allows exact and simultaneous adjustment of tenon spindles.
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Heavier Construction for greater accuracy.

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—Compare this speed with hand sanding!

Each Sand-O-Flex sanding wheel contains 8 abrasive strips backed up by 8 separate brushes. When rotated at usual motor speed, you get 14,000 sanding strokes per minute! Not only does Sand-O-Flex sand faster — it gets in and around intricate shapes that were formerly sanded by hand. Garnet cloth abrasive strips unroll when worn. Replacement cartridges in many grits available at low cost. Fits your present power tools, 4 sizes. See your dealer or write for literature.

MERIT PRODUCTS, INC.
4023 Irving Place, Culver City, California

CLOTH-TYPE DUST COLLECTORS

American Wheelabrator & Equipment Corporation, Mishawaka, Indiana has just published a new 36-page catalog, "Dust and Fume Control" which describes the various sizes and models of Dustube collectors (cloth-tube type) and the advantages to be gained from cloth filtration.

Standard assembled and knocked-down models of this equipment have a range of air flow capacities upward from 252 c.f.m. and filter the air through various kinds of cloth—cotton, wool, and synthetics—depending upon the application. Continuous automatic collectors are provided where requirements are such that service must not be interrupted for shaking the filters to release accumulated dust. The description of each type of collector is accompanied by complete specifications, construction drawings, cut-away views, and illustrations of typical installations.

FINISHING AIDS

A new and easy way for furniture manufacturers to obtain improved toughness, scratch resistance, and clarity in wood finishes without any change in normal manufacturing procedure has been developed through the efforts of the DuPont Co. and Behr-Manning Corp., Troy, N. Y., Division of Norton Company.

Two new products, used together, replace the conventional sanding sealer and regular sandpaper. The products are a clear sealer to be sold under the DuPont Company's "Tufcote" trademark, and two new sandpaper items to be marketed initially by Behr-Manning Corp., under the trademarks "No-Fil" garnet finishing paper and "No-Fil Durite" finishing paper. Later these papers may be available from other manufacturers of coated abrasives.

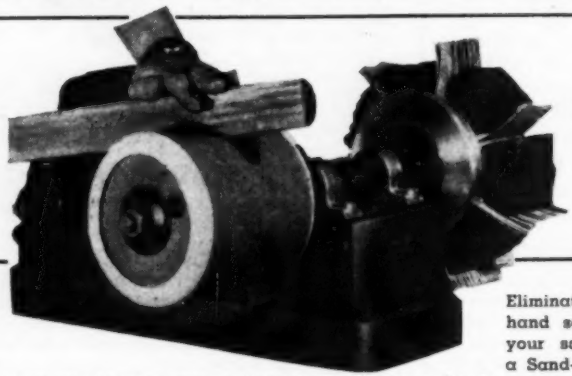
Up to the present, the furniture industry has been able to use a tough sealer only by sacrificing build and ease of sanding. Now, with the aid of the new finishing papers, the furniture manufacturer may, at no sacrifice in ease of sanding, and with no added operations, use a high build sealer and obtain greatly improved toughness and adhesion in his finish.

"Tufcote" sealer is a clear, fast-drying wood sealer, light in color, providing good build in one coat over close grained or filled wood. After air drying or forced drying it may be sanded using one of the special finishing papers.

These new finishing papers are similar to standard sandpapers in backing and abrasive grains. They differ from standard papers in containing an ingredient which prevents abraded particles from sticking to the sandpaper and shortening its life. The ingredient eliminates what is known as "loading" and gumming.

"No-Fil" garnet, a natural quarried abrasive, and "No-Fil Durite," an electric furnace silicon carbide abrasive, are available in the "A" weight grades common to sealer coat preparation in standard 9"x11" sheet form or special sizes.

SPEED UP YOUR SANDING OPERATIONS



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"DUO"
SANDER

Eliminate costly and tedious hand sanding . . . speed up your sanding operations with a Sand-Rite "Duo". The "Duo" is a combination pneumatic drum and rotary brush sander that will produce A-1 finishes on wood stock of rounded contour and irregularly curved shapes.

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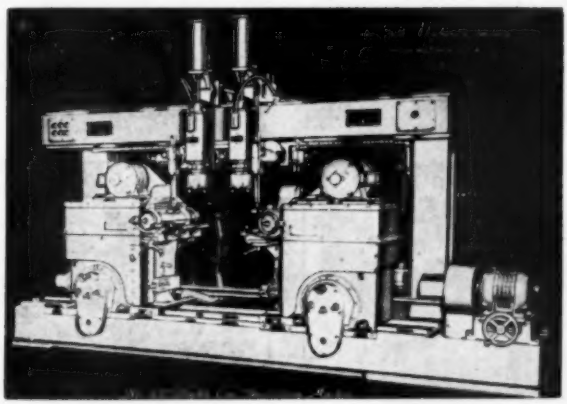
EQUIPMENT and Supplies for the WOODWORKING INDUSTRY

AUTOMATIC DOVETAILING MACHINE



This new automatic dovetailing machine was introduced at a recent regional meeting of the Midwest Section of the F.P.R.S. by the Bell Machine Company, Oshkosh, Wisconsin. This machine, model No. 200 double end automatic dovetailing machine, combines additional operations simultaneously with its main function, by boring drawer fronts for hardware while cutting the female dovetails, and branding or stamping the trade name of the user on the inside of the drawer while cutting the male dovetail.

Briefly the No. 200: cuts the female dovetail in drawer fronts or drawer backs, one piece at a time, both ends at one time; cuts the male dovetails on drawer sides, two pieces at one time, both ends at one time; bores drawer fronts for hardware while cutting the female dovetail, or can be used as a vertical boring machine, independent of the dovetailing units; brands or stamps the trade name of the user on the inside of the drawer while cutting the dovetail (optional); handles straight, curved, serpentine, half swell or concave drawer fronts; will dovetail up to 2,000 drawers (8,000 pieces) in one day, using only one man.

The No. 200 combines four machines

into one: (1) double end, female dovetailing machine, (2) double end, male dovetailing machine, (3) single or multiple head, vertical borer, and (4) trade name branding press.

BIG CAPACITY DUST COLLECTOR

Dustbuster, a low cost, self-contained dust collector, formerly available in direct drive for 50 or 60 cycle power, may now be ordered for operation on 25 cycle power.

Introduced over three years ago by Aget-Detroit Company, Dept. W D., Ann Arbor, Michigan for use in collecting dust from sanders, saws, jointers, planers, etc., Dustbuster has heretofore been restricted to operation on 50 or 60 cycle power. The previous design, which also employs a paddle wheel, self clearing fan, had been mounted directly on the motor shaft. Since the efficiency of the unit and the maintaining of its rated 650 cfm. suction depends on a fan speed of approximately 3600 rpm., an overdrive was indicated for the lower frequencies. For operation on 25 cycle power, a V-belt drive through a counter shaft permits a fan speed of a nominal 3600 rpm.

The Model JS Dustbuster has a 1/3 hp., continuous duty motor mounted on a cabinet that encloses a caster-mounted, heavy duty trash can of 31 gallons capacity. The cabinet also has a frame, which is both a support and a filter shaker for an oversize cloth filter. The discharge from the blower is in such direction as to tend to throw the heavier dust into the collecting can somewhat after the manner of a cyclone separator. The finest dusts are taken out by the filter and the cleaned air returns to the working space. This eliminates the necessity of pipe connections to out-of-doors. In addition to saving the costly and time consuming installation, it also permits a saving of heat by returning the cleaned air to the working space.

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NOW AVAILABLE — in 1/4", 5/16", 3/8", 7/16", 1/2", 5/8" and 3/4" sizes in kiln dried Beech, Hickory and Hard Maple. Spiral grooved. Dowel Rods made from Hard woods in sizes 3/16" through 1-7/16" are now also ready for shipment. Let us quote on your requirements. Prompt Shipment.

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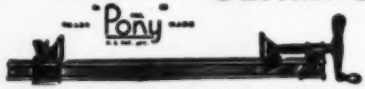
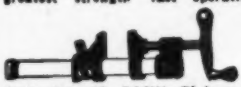
"Jorgensen" CLAMPS
"Pony"



Style No. 70 "JORGENSEN" I-bar Clamps for greatest strength fast operation, and economy.



Style No. 50 PONY Fixtures make ideal bar clamps on black pipe — any length.

"JORGENSEN" "C" clamps are built to take hard service, at low cost.

Genuine "JORGENSEN" Handscrews — hard maple jaws, steel spindles. You can depend on them.

ADJUSTABLE CLAMP COMPANY
"The Clamp Folks"
418 N. Ashland Avenue
Chicago 22, Illinois

Removal of the collected dust is quick and easy: A spring-supported cover for the trash removal can is secured by snap latches. These are unlocked and the can is wheeled away to the point of disposal. A hand shaker crank permits regular shakedown of the filter as required. The filter material is specialy treated for separating fine dusts.

This unit is recommended for collecting dusts from sanders, saws, jointers, planers and other remotely located equipment that generates fine dusts in large volumes.

CUT WITHOUT LAYOUT

A circle cutting attachment for bandsaws which permits cutting of circles and radii without layout has been designed by C. C. Johnson, an employe in the woodshop at Texas Engineering and Manufacturing Company, Inc., Dallas, Texas, where use of the tool has effected an average reduction of 90 percent in the manhours required to produce discs and other wooden items having one or more curved dimensions.

Quantities of as many as 200 different parts of this nature sometimes are required by the company in a single month. Uses range from cover

BEVEL RIPPING . . .
ONE OF OVER 1000
WILSON OPERATIONS

A WILSON IS YOUR BEST INVESTMENT

WILSON
RADIAL CUTTING MACHINE

MAKE YOUR *"PILE OF STOCK"*
Pay EXTRA Dividends with a
STURDY, SPEEDY, ACCURATE
WILSON

For further information write to

MEDIA MACHINE WORKS,
INC.
MEDIA, PENNSYLVANIA, U.S.A.
Est. 1922

plates for holes left in aircraft engines when accessories have been removed to shipping crate cradles and stool tops.

Johnson's jig is easily handled by one man; and only two or three minutes are required to set it up and put it into use, we are told. The tool consist of an auxiliary table 24 inches square and 1½ inches thick, which is placed on top of the regular bandsaw table and secured with two thumb screws. A movable radius gauge pin on the auxiliary table acts as a pivot on which the operator revolves the wood from which the circle is to be sawed. This pin is positioned by use of two scales scribed at right angles to each other on the top surface to permit squaring the wood, thus centering the radius gauge pin. The wood is then pressed against the needle-sharp pin, and the jig is set for the accurate cutting of any number of circles of the same dimension without layout or resetting the jig.

Previous method of sawing the circles was to layout the pattern with a pencil, saw outside the line to allow for inaccuracies resulting from hand feeding of the wood to the blade, and then dress the curved side on a sander, a time-consuming process which had to be repeated many times on large jobs.

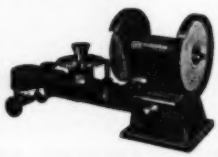
Johnson's tool consists of only six major components and will handle circles up to 48 inches in diameter.

SMALL INDUSTRIAL SANDER

Compact and light (only 7½ lbs.), yet with ample power and capacity for continuous production use, the new Millers Falls No. 870 7-inch standard industrial sander is designed for fast sanding, wire brushing, grinding and polishing on wood and other surfaces. The sander is manufactured by the Millers Falls Co., Greenfield, Mass.

In addition to use with standard wheels, discs and brushes, it offers exceptional performance with the new

CUT
SAW MAINTENANCE
COSTS!
with the
REYNOLDS
CIRCULAR SAW
GRINDER
for
rip, cut-off, and combination saws
(5" to 30" diameter)



Produces top quality results in fraction of time usually necessary for sharpening, jointing, gumming and tooth forming. Any hook or pitch of tooth and depth of cut is quickly adjusted. Both hands are free to control position of saw while grinding.

WRITE NOW FOR FREE CIRCULAR!

PROVIDENCE SAW & KNIFE CO.
Dept. WD 303 Eddy St. Providence 3, R.I.

Hamilton
FACTORY TRUCKS
ESPECIALLY DESIGNED FOR THE WOOD-WORKING INDUSTRY
NO. 800

Cap. 1500 lbs.
Heavy Duty Wheels & Casters
Standard sizes 24" x 48"—30" x 48"—30" x 60". Special sizes and styles to order—capacities up to 7500 lbs.
Write for descriptive circular and low prices.

THE HAMILTON CASTER & MFG. CO.
1800 Dixie Highway Hamilton, Ohio

laminated phenolic grinding wheels and discs. Ideally suited for woodworking plants, its versatility and ease of operation make it a time and money saver on a wide variety of work, says the manufacturer.

The sander is regularly supplied with a 7" flexible rubber pad, 7" semi-rigid Co-Ro-Lite pad, and three 7" assorted cloth-backed sanding discs. Many other accessories may also be obtained, including standard cup grinding wheels, wire cup brushes for removing rust, scale and paint, and the new, high-performance laminated phenolic wheels and discs.

HOT SPRAY LACQUER

A new hot spray lacquer that fully meets manufacturers' requirements for cabinet, case goods and general furniture finishing has been developed by Barrett Varnish Company, 1532 S. 50th Court, Cicero 50, Ill.

Named "Wonderhot" lacquer, this new hot spray finish needs no agitation. For many applications, no rubbing is required; but if a piano finish lustre is needed, it may be rubbed like any other lacquer, according to the manufacturer. The flatting agent is not affected by heat, it is said.

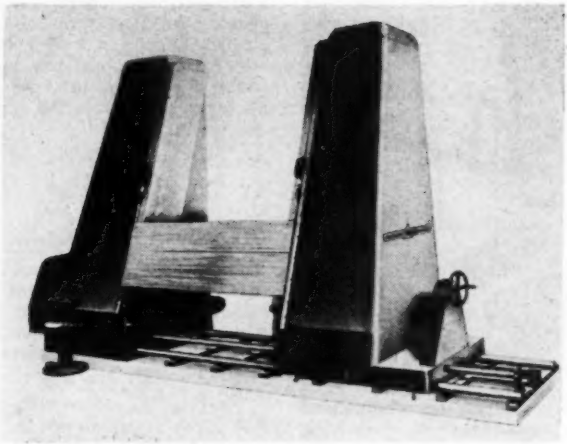
TEST YOUR LUMBER
The Most Modern Way

MOISTURE REGISTER

● A fast and easy way to test the moisture content of lumber or veneer. The RF4 type shown is used to test finished or rough lumber. We also carry the V2 type for veneer testing. No needles—finished pieces may be tested without marring the surface. The instrument tests accurately as low as 0 moisture content. Portable, fast and accurate, it is guaranteed for one year and comes complete with fabrikoid carrying case.

THE STANDARD DRY KILN CO.
798 S. HARDING ST. • INDIANAPOLIS, INDIANA

SWISS CUT-OFF SAW

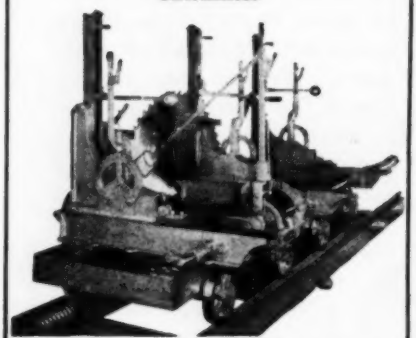


The Woodworking Precision Machinery & Tool Co., Inc. is introducing in the United States the Swiss-made Asko machine.

The Asko is a new double-cut-off saw which operates vertically. The saws do not travel back through the piece thereby eliminating clamping of the stock to increase production.

The dust system is built into the

Machined Steel Racks and Pinions insure accuracy on all ENTERPRISE sawmills.



THE ENTERPRISE COMPANY

SUBSIDIARY OF WM. K. STAMETS COMPANY
MACHINERY BUILDERS & ENGINEERS
PITTSBURGH

Columbiana, Ohio, U.S.A.

USE "any old heat" TO MELT GLUE

IF "any old result" IS GOOD ENOUGH

There's good craftsmanship in gluing the same as in woodworking. Fine cabinet and pattern craftsmen all over the country have used Sta-Warm glue pots and tanks for the past thirty years. They have proved with repeat purchases that heaters carrying the "Sta-Warm" trademark are dependable, efficient . . . and most economical in the long run.

Inquire today for prices and illustrated catalog literature.

Sta-Warm ELECTRIC CO.
109 N. CHESTNUT ST. • RAVENNA, OHIO

Asko. Cut-offs fall in front of the machine, thus eliminating blocking of the exhaust system.

More information on this machine may be obtained by writing to the Woodworking Precision Machinery & Tool Co., Inc., 224 Fifth Avenue, New York City.

SAW RASP

A new combination tool is now being offered by Tec Imports, 14404 Addison St., Van Nuys, Calif. Called the Stickleback Drilsaw, the tool drills and saws in any direction and any shape hole in lumber or plywood. The manufacturer tells us that it replaces the brace and bit, keyhole saw and rasp.

It is further stated that the tool, after drilling its own hole, saws any shape and direction—up to 12" in plastered walls. It is available in either fine or coarse toothed models. The tool is especially recommended for sign making, light routing, drilling for wiring or plumbing. It will not work metal of any kind. Diameter size ranges from ¼" to ½".

ELECTRIC PRODUCTION DRILLS

Stanley Electric Tools, New Britain, Conn., announces six new electric drills for heavy-duty production drilling in wood and metal. The outstanding features of these streamlined power drills include die-cast polished aluminum housing for lighter weight, trigger switch with safety locking device, sealed ball bearings, three-jaw geared chuck, and chuck guard to protect worker's hands.

Drills can be supplied in any standard voltage; operates on D.C. or A.C., 60 cycles or less. Drills are available in three different chuck sizes: ¼", 5/16", and ⅜", and in two different type handles—"D" shape and "drop" handle.

5 BASIC UNITS IN 1 PLURALITY

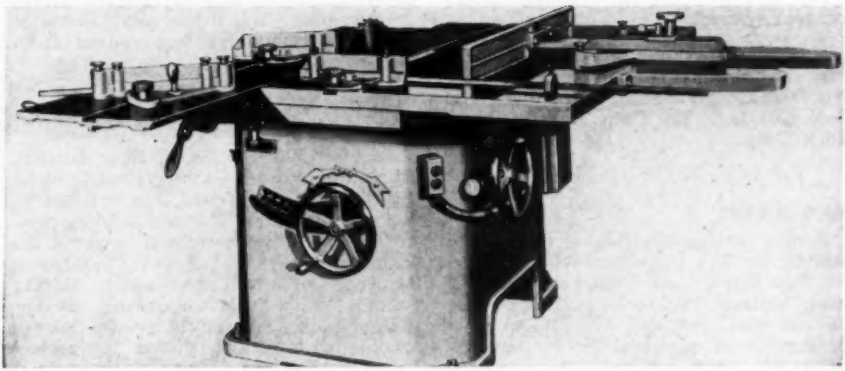
OILSTONE GRINDERS

With one Mummert-Dixon Plurality Oilstone Grinder you get (1) Coarse Oilstone Wheel, (2) Fine Oilstone Wheel, (3) Grinding Cone, (4) Leather Stropping Wheel and (5) General Grinding Wheel. Made in 3 sizes to meet every grinding and sharpening requirement in woodworking plants. Designed for hard and long usage. Efficient. Easily accessible. Investigate Mummert-Dixon equipment now. Send for informative literature today. No obligation.

MUMMERT-DIXON CO.

124 Philadelphia St., Hanover, Pennsylvania

VARIETY SAW

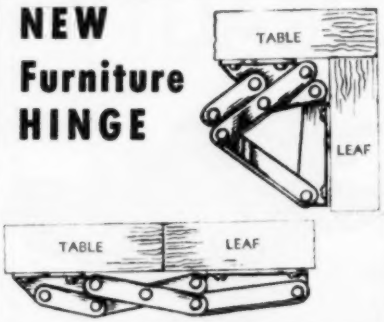


The Northfield Foundry & Machine Co., Northfield, Minn., is offering a new and improved variety saw, tilting arbor type. It is arranged with both rolling table and extended table. The machine is furnished in four styles.

The frame is a heavy one piece casting to which are bolted the arbor carriage cradle and the table top. The sawdust chute is also built into the frame, terminating in a stationary outlet at the rear.

The saw arbor runs in precision self-aligning ball bearings. Arbor extension is furnished with the machine and this has a capacity for dado heads

NEW Furniture HINGE



This LAZY TONG HINGE Increases saleability and beauty of furniture by eliminating gap formed by conventional hinges. Smooth-acting and rugged. Positive action. Permits new designs. Attractively priced. Write for information.

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4112 Market Street, San Diego 2, Calif.
Exclusive Distributors

Better-Built Trucks by TOWSLEY

give better service, last longer, cost less in the long run.

Phone, wire, or write for quotations!

TOWSLEY TRUCKS, INC.
1760 Elmore St. Cincinnati 23, O.

4" wide. The motor is built on the arbor and has a 5 hp. continuous duty rating. It can be furnished in 220 or 440 v., 2 or 3 phase 60 cycle current and is controlled by a magnetic switch with push buttons.

Equipment furnished with the machine includes a grease gun, 4" arbor extension, two combination sliding miter or cut-off gauges, adjustable ripping gauge of the rack and pinion type, arbor nut wrench and arbor holding pin.

NEW WALL PANEL

A beautiful, new interior cedar panel, Cedar-ridge, is being introduced and distributed throughout the Middle West by Aetna Plywood & Veneer Company, 1737 N. Elston, Chicago.

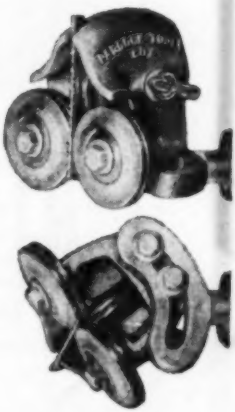
One of the chief attractions of Cedar-ridge is its rich, reddish brown natural color which adds a comfortable, warm

MORE SPEED — MORE SUPPORT — MORE WORK

SAVE MONEY

Protects Blades
SPEEDS UP PRODUCTION!

Here's a low cost way to reduce costly Blade Breakage — enable old or new Band Saws to cut more material — protect workmen! PADDOCK GUIDES hold working portion of blade as if in a frame. Model 20 as pictured enables 36" machine to cut material 22" wide at an angle up to 45° — with simple, quick adjustment. (lower unit shows angular adjustment) Ball bearing wheels turning with blade give friction-free support! Wheels are interchangeable for balanced wear and long life. Write for circulars and prices!



PADDOCK TOOL CO.

Guide Makers Since 1920

1418 WALNUT STREET — KANSAS CITY, MO.

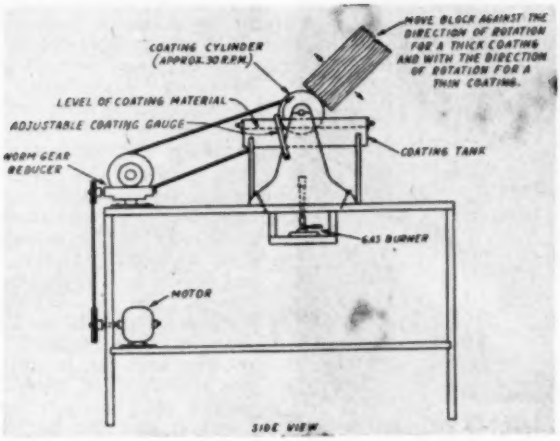
Paddock
BALL-BEARING
BAND SAW GUIDES

look to any room in which it is used. Another outstanding feature is the parallel-line design, with ridges and grooves unevenly spaced. Lights and shadows catch in these ridges and grooves, varying the design and keeping it forever animated. Ridge tops are machined to resist splintering and denting, but the natural pattern of the wood-grain remains visible.

The panel has extensive possibilities for wall paneling, ceilings, cabinet doors, partitions, fixture displays. It is flexible in adjustment and adapts to many interesting and novel pattern arrangements.

After the panel is machined, it is dipped in Peneseal, a Dow Chemical solution for priming and sealing. This dipping treatment gives the surface a hard finish so that no further finishing is required. However, it may be used in its natural surface or finished with paint, stain or lacquer.

HANDY GLUE SPREADER


COATING CYLINDER
(APPROX. 30 R.P.M.)
MOVE BLOCK AGAINST THE DIRECTION OF ROTATION FOR A THICK COATING AND WITH THE DIRECTION OF ROTATION FOR A THIN COATING.
LEVEL OF COATING MATERIAL
ADJUSTABLE COATING GAUGE
COATING TANK
WORM GEAR REDUCER
GAS BURNER
MOTOR
SIDE VIEW

A simple, hand-operated glue spreader, developed at the U. S. Forest Products Laboratory at Madison, Wis., in the course of its research, provides a convenient method of applying a uniform glue film to long, narrow wood strips. The spreader was designed so that it can be moved by hand along the upper surface of the wood strip; it will handle material up to 4 inches in width. The

Find out how Woodsman Carbide Tipped Saws can give your Real Savings and More Profit.

A Saw To Fit Every Service Need

16 different styles of Woodsman carbide tipped blades for any application, guarantees more efficient and profitable saw operations.

Styles available are:

Planers	Trimmers
Mitres	Rips
Combinations	Cut-offs
Crosscuts	Special Designs

DEALERS WANTED

NORTH AMERICAN PRODUCTS CO.
3100 W. CHERRY ST. MILWAUKEE 8, WIS.

MILWAUKEE WROT WASHERS
SINCE 1887

WASHERS - BLANKS STAMPINGS

Your most dependable source of supply—the world's largest manufacturer of Washers, serving Industry since 1887. Over 22,000 sets of Dies.

Submit your blueprints and quantity requirements for estimates.

WROUGHT WASHER MFG. CO.
The World's Largest Producer of Washers
2261 S. Bay Street Milwaukee 7, Wis.

glue reservoir, 4 inches wide and curved to a radius of about 3 inches, has sufficient capacity to cover about 75 lineal feet of nominal 2-inch-wide lumber at a spreading rate of 50 pounds of glue per 1,000 square feet of area. The simplicity of the unit facilitates thorough, easy cleaning after use.

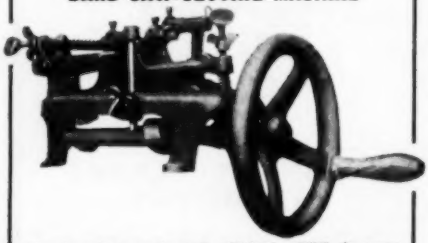
The compactness and portability of the device make it especially useful for small gluing operations where limitations of space or cost do not permit the use of a stationary, motor-driven spreader. Its construction requires only those skills and facilities ordinarily found in a small workshop.

As shown in the photo, the spreading mechanism consists of a cylindrical wood block or roller mounted in a plywood frame. The cylinder is covered with corrugated rubber floor matting and is flanked with protruding metal flanges. The metal glue reservoir is hung on the bolt so that its bottom edge forms a "doctor" bar with the cylinder and can be adjusted to regulate the flow of glue. Rubber skirts form a seal between the sides of the reservoir and the flanges.

CONTOUR CUTTING TOOL

A high-speed portable cutting tool

SIMPLEX
BAND SAW SETTING MACHINE

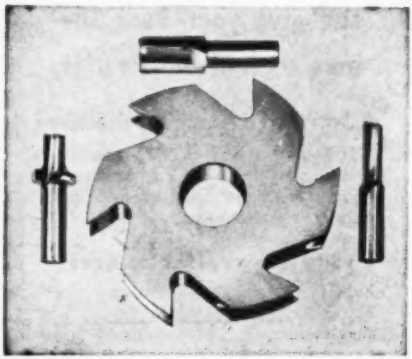


Simple yet accurate and efficient. Will do more and better work than any other machine of its kind.
The vise takes saw blades ⅛"—1½" in width and by automatically gripping the saw while tooth is being set, prevents twisting of narrow saw blades. The feed finger is adjustable to teeth with ⅛"—⅝" spacing, point to point.
All adjustments for different widths, teeth etc. are regulated by but two thumbs screws.
Best working speed 100 revolutions (200 teeth) per minute, each revolution setting two teeth. A saw can be set in 4 to 5 minutes.
The machine can be fitted with a flat or V pulley for power operation if desired.

Further Details Upon Request

ZEILLER & NAGEL, INC.
232 JAVA ST. BROOKLYN 22, N. Y.

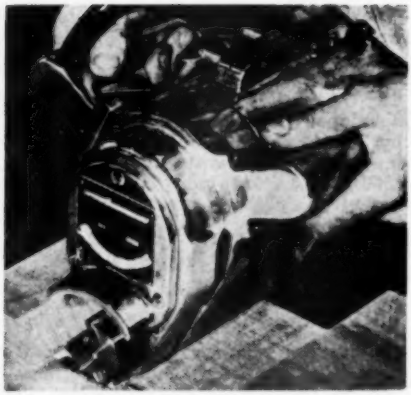
Sterling Quality
Woodworking TOOLS



Router Bits - Form Cutters
Shaper Cutters - Sash Cutters

Some dealer territories open

STERLING CUTTER & MFG. CO.
728 Sixth Street Rockford, Illinois



has just been introduced. Named the "Handshaper" by its makers, Composite Die Supply Co., Dept. 166 of 14310 Birwood, Detroit 4, Mich., the machine is actually a portable milling machine—planer—router combination. Numbered among the many uses of the versatile contour cutter are the cutting and shaping of wood, plywood, plastic, Masonite, etc.

"Handshaper" can be operated with ease by both skilled and unskilled personnel. The machine will follow concave and convex curves and at the same time can be moved upward or downward to cut in two directions, a feature that reduces many lengthy skilled operations to minutes. Furnished with one cutting head and two high speed adjustable cutting blades, the new tool has a 60 cycle 115 volt and DC 18,000 r.p.m. motor with 12 ft. extension cord, screwdriver, blade and head wrenches.

WOODEN JET

Wood, glue and screws are virtually the only materials in this mock-up of the Westinghouse J40 jet aircraft engine at the Company's Aviation Gas Turbine Division, South Philadelphia, Pa. This precise replica of the stainless steel and aluminum engine that is now in quantity production for the U. S.

High Speed HANGER BOLT DRIVING . . .

A NEW, FAST OPERATION TIMED IN SECONDS!

This tool is used by a majority of plants where hanger bolt driving is done on a high production basis. Can be operated at any speed which is safe for driving the hanger bolt. (It is not necessary to stop rotation at any time.)

- AUTOMATIC TAKE-UP FOR WEAR ON JAWS
- REVERSING POSITION OF CLUTCH GIVES DOUBLE WEAR AT HALF COST
- AFFORDS ACCURATE PROJECTION HEIGHTS
- USE WITH ANY AIR OR ELECTRIC DRILL OR DRILL PRESS

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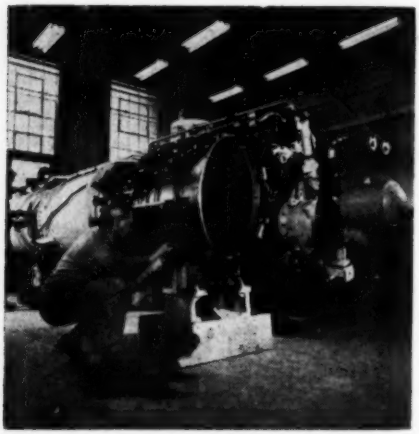
TITAN TOOL CO.
Production Tools
49 Main St. FAIRVIEW, PA.

44" vertical band resaw

WRITE
McDONOUGH MANUFACTURING CO.
Incorporated 1888
EAU CLAIRE, WISCONSIN
"World's Largest Producer of Band Resaws"



Navy enables airplane designers to make the necessary allowances for size, accessories, and other problems involving the engine's configuration. The wood construction—aside from being inexpensive-also makes it easy for the model shop to keep the engine up to date as its form evolves from engineer's calculations.

UPSON INTRODUCES WATERPROOF PANEL

Just as a novel stunt to introduce its new Strong-Bilt waterproofed panels, the Upson Company of Lockport, New York, had a nine-foot rowboat built of the new panels from regular stock. And it actually worked!

The Upson Company most definitely and emphatically does not recommend that the new material be used for boat building! But this use of the panels does demonstrate that they are waterproof!

Upson Strong-Bilt waterproofed panels for walls and ceilings were developed to overcome objections found in wall coverings which were not waterproof and are designed primarily for dry built full-wall construction.

Tests conducted by the Pittsburgh Testing Laboratory proved that Upson Strong-Bilt waterproofed panels do not absorb more than 13.5 percent by weight when entirely submerged in water for 24 hours. In another test made by Dr. Water Paul Ericks, director of the Upson Research Department, who developed the waterproof process, a 7 by 9 inch sample panel has been floating in a pan of water since March 20, 1950 without any indication of delamination!

INSULAR AGAIN SHIPS PHILIPPINE MAHOGANY

Philippine mahogany in a wide range of finished lumber is again being shipped to the United States in pre-war quantities, it has been announced by the Insular Lumber Company in Philadelphia, Pa.

Insular, whose plant facilities have been restored after war-time devastation, is the only mill in the Philippines capable of shipping kiln-dried finished island hardwoods in quantity.

The highly lustrous woods—dark and light red Philippine mahogany— are available in beveled and V-type exterior siding, interior wall paneling, and in a variety of moulding patterns for interior trim.

Production of tropical hardwoods on Negros Island—Insular's mill is located at Fabrica, company town of 20,000 people on the island—had come to a virtual halt when American troops liberated the island after four years of Japanese occupation.

An accelerated $2,500,000 rehabilitation program—$300,000 was expended on the planing mill alone—initiated in 1946 enabled Ilco to equal pre-war production in only five years, despite the scarcity of necessary mill machinery.

Climax of the planing mill restoration program was the installation this year of a modern Stetson-Ross planer, an all-electric, eight-ton planer and matcher capable of working 80,000 board feet of lumber per eight-hour shift.

PUT IDLE STEEL TO WORK

. . . to make NEW steel

Steel mills use *one* ton of iron and steel scrap in making every *two* tons of open-hearth steel.

But normal sources of iron and steel scrap can't keep up with demand. That's why the steel industry asks you to collect your scrap—in the form of obsolete, worn-out machinery and parts—and send it back to the mill.

Only with *your* help can current military and civilian production demands be met.

Start *your* scrap salvage program today—call in your local scrap dealer *now.*

NON-FERROUS SCRAP IS NEEDED, TOO!

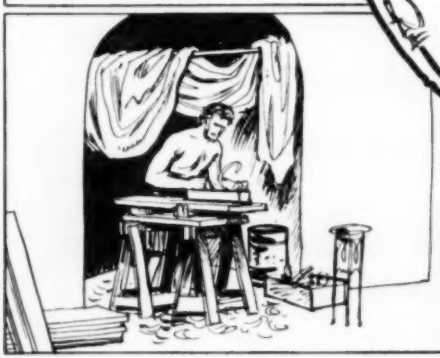
WOOD WORKING DIGEST

222 E. Willow Ave., Wheaton, Illinois

Mechanics Through The Ages

IN EARLY COLONIAL DAYS THE IROQUOIS AND OTHER INDIAN TRIBES EMPLOYED FRENCH AND ENGLISH BLACKSMITHS TO MAKE FOR THEM SMALL, LIGHT IRON TOMAHAWKS MORE DEADLY THAN THE STONE WEAPONS THEY PREVIOUSLY USED.

THE SMITH OF OLDEN TIMES USUALLY SET UP HIS ANVIL SO THAT THE KNUCKLES OF HIS CLOSED FIST JUST GRAZED THE ANVIL'S SURFACE WHEN HE STOOD ERECT AND LET HIS ARMS HANG NATURALLY AT HIS SIDES.



ROMAN CARPENTERS USED PLANES OF METAL REMARKABLY LIKE THOSE FAMILIAR TO US TODAY.

They all use...

Moak Single Spindle Shapers and Speedikut Cutters

TO MAKE FAST-SELLING SHAPED WOOD PRODUCTS

What a combination!

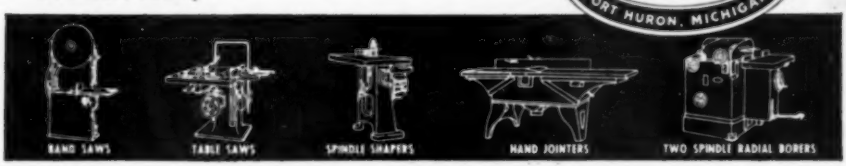
***Moak Single Spindle Shapers*—with speeds up to 12,000 rpm, precision ground table, simple adjustments.**

***Moak Speedikut Cutters*—precision ground from hardened 18-4-1 high speed steel, undercut to maintain original balance when re-ground, and true form relieved.**

Together, they produce rapidly and at low cost the various shapes for furniture, moldings, copings, cabinet-work, sash and paneling that add smart finishing to woodwork.

***Get the facts* on Moak Shapers and Speedikut Cutters. Write for colorful illustrated booklets today.**

MOAK MACHINE & TOOL CO
MOAK
PORT HURON, MICHIGAN



YEAR-END REVIEW

By Secretary of Commerce Charles Sawyer

The volume of national output increased by about 8 percent in 1951 as compared with 1950, and was higher than that of any other year. This large expansion in production permitted us to push ahead toward our objective of increased military strength, while at the same time broadening our productive capacity. The needs of consumers were also met on as high a scale as in the preceding year—a period of high consumption.

During the course of the year the pace of advance in output slackened, and in the final quarter the total volume of national output was about 5 percent above the rate in the fourth quarter of 1950.

The value of output of final goods and services—the gross national product—totaled $327 billion, 15 percent more than in 1950. Roughly, half of this rise represented higher prices, and the remainder the above-stated increase in volume. This expansion in the volume of output was attained by increased utilization of the nation's manpower, by expanding facilities, and by the more intensive use of existing capacity.

Unemployment, which had averaged about 3 million in 1950, was reduced to 2 million in 1951. Although certain materials, particularly the basic metals, had become in tight supply and had to be allocated, no significant shortages of civilian end-products developed during the war.

In 1951, as we mobilized our resources for defense, expenditures for military and related purposes were $34 billion —more than double the 1950 total. Along with this large increase, the flow of civilian products was maintained in volume, but cost consumers 6 percent more than in 1950 because of higher prices. Most of the price advance occurred prior to the inauguration of price and wage controls in January, but many prices moved up subsequently.

We also made available a larger volume of goods and services to strengthen the economies of foreign nations.

Prices in 1951 averaged considerably higher than in 1950—up to 12 percent in the case of wholesale prices. High output of civilian goods together with some abatement in consumer demand and the controls of credit, prices, and materials brought about a less uniform price movement than was the case a year earlier. Thus, wholesale prices rose to a peak in March and then declined gradually during the next several months. At the year's end they were slightly higher than at the end of 1950.

Retail prices—the prices paid by consumers—continued to rise during most of 1951, though at a lesser rate than the rapid upsurge during 1950.

Although the inflationary pressures —a major concern at the beginning of 1951—had eased off as the year progressed, the economy at year-end was faced with many basic problems. Chief of these were:

1. To build up our military strength as rapidly as possible while maintaining a strong civilian economy, and to utlize both large and small business in securing needed production;

2. To conserve and channel our available scarce resources most equitably and efficiently so as to meet our defense objectives and yet, to the extent consistent with our military needs, to minimize the adverse effects upon the civilian economy, and particularly to small business;

3. To prevent or to contain any resurgence of inflationary pressures either through the impact of higher costs of doing business or of new waves of demand; and

4. To obtain an approximate balance in the defense period ahead between government expenditures and income so that our defense effort may be paid out of current receipts insofar as possible.

(This is a condsensation of the complete report.)

The Market Place

Rates for Classified Advertisements

Lists of Used and Rebuilt Machinery, either For Sale, Wanted, or For Exchange, set in uniform style, will be published in the Classified Section at the rate of $7.50 for name and address and a five line advertisement. For additional lines, only 75c per line.

DISPLAY ADVERTISEMENTS: 1 inch (Minimum), $8.50; 2 inches $17.00; 3 inches (Maximum), $25.00.

Write directly to those offering the machine for sale, for prices and full descriptions. If what you seek is not advertised, write Hitchcock Publishing Company, 222 E. Willow Ave., Wheaton, Ill., making known your wants on either new or used machinery and the publisher will gladly assist you.

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Largest stock of used machinery in America, many ball-bearing, motorized. Substantial savings. Prompt shipment. Write for our list. We equip plants completely. We also buy complete plants or individual machines.

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565 W. Washington Blvd., Chicago 6, Ill.
Phone RAndolph 6-4970

FOR SALE

Woodward Machinery Co.
309 E. Second St Cincinnati 2, Ohio

Band saw, Parks, 16 in., M.D., $75.
Borer, Andrews 60 in. 5 spindle Horizontal, $350
Borer, Andrews 42 in. vertical, 4 spindle, $350
Dowel Sticker, F & E No. 1, $350.
Glue spreader, Perkins 60 inch double, $200.
Jointer, Crescent 24 inch, $150.
Jointer, Egan 8 inch round head, $150.
Molder, Smith 8 inch 4 side, $750.
Molder, Smith 6 inch 4 side heavy M.D., $650.
Mortiser, Greenlee Horizontal, HC, $125.
Mortiser, New Britain No. 7 chain saw, $400.
Mortiser, Parks light vertical HC, $75.
Mortiser, Sidney vertical HC, with Mtr., $300.
Planer, Whitney 30 inch round head, MD., sec. roll, double, $750.
Radial saw, Multiplex 1½ HP, 3 phase, $200.
Ripsaw, Greenlee self feed, $225.
Sander, Berlin, 42 inch 3 drum, $600.
Shaper, Advance, BB., MD., double, $350.
Saw, F. & E. No. 291 automatic double cutoff, $500.
Saw, Hamilton 20 inch heavy duty, Variety, $175.
Saw, DeWalt Radial 3 HP, $250.
Shaper, Delta, single spindle BB MD, $185.
Sticker, Fay 6 inch 3 side, $250.
Tenoner, American, 2 copes and cutoff saw, $350.

FOR SALE

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1269 Culver Road Rochester 9, N. Y.

Borer, Amer. dbl. spdl, radial adj. horiz.
Clamp, 8'x4' Sash-Door, Hermance
Double Cut-Off Saw, Amer. No. 3, 7½ H.P. motor
Gang Variety Saw, American, b.d.
Lock Corner Machine, dbl spdl., Morgan No. 4
Nailer, Morgan No. 9, closed back,
Planer, Buss No. 4, sgl., 26"x7", sect. roll
Planer-Matcher, Woods 14"x6", 40 HP
Shaper, American double spdl. b.b,, d.m.d.

American Machinery Exchange, Inc
Woodworking Machinery—new & used
2040 — 2044 W. Lake St., Chicago 12, Ill.

Moulders, sanders, self-feed rip saws, band rips, routers, glue jointers, saw tables, planers, and many other items of new and used machinery.
Send us your inquiry.

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All machines rebuilt and fully guaranteed.

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Dovetailer, Dodds 10-spindle, M.D.
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Glue cooker, 10-gal. Francis steam
Glue jointer, Jenkins No. 3CDA motorized
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Moulder, 6" Vonnegut 4-head, with hopper
Sander, 54" Nash No. 77 2-Spdl. auto. turning
Swing saw, 6' Reliance with 3 HP motor dr.
Woodworker, Sidney Universal, five machines

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P. O. Box 230 **Asheville, N. C.**

Air Compressors, various sizes
Air Compresser, Gardner Denver 10x10 Twin dmd.
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Band Saw, Cordesman 30" pb. bd. & motor
Band saw, New Crescent 20" bb. dmd.
Band saws, Amer. B-36 36" bb. & motor
Band saws, New Moak 36" bb. dmd.
Borers, McKnight No. 88 dmd.
Borer, Amer. 2 spindle radial dmd.
Borers, Moak 2 spdle. horiz. bd.
Borers, Indiana 15 H 2 spdle. dmd.
Borer, Root 2 spindle horiz., dmd. style "K"
Boring & sawing, McKnight 26F dmd.
Clamp, Handy No. 61 Air oper., 24x45 jaws
Clamp, Handy No. 58 Cabinet Clamp
Clamp, Handy No. 406 Air oper. case clamp
Clamp, Handy No. 418 End clamp, air size 48x60
Clamp, Handy No. 31 End clamp, air
Clamp, Handy No. 71 Revolving Case Clamp
Clamp, Lancaster Bed panel air clamp
Clamp, Taylor, 40 sec. 4 clamps, 7 ft.
Clippers, Coe 88" bd. & motor
Dovetailers, Dodds, 10-15 and 20 spindle.
Frequency changers, 15 KW and 50 KW dmd.
Glue jointer, F&E No. 429, bb. dmd.
Glue jointer, Jenkins No. 343A bb. dmd.
Glue Jointer, Yates American No. 213 bb. dmd.
Jointer, Amer. 12" bb. dmd.
Jointers, New Moak 12", bb. dmd.
Lathe, Yates No. 74 bb. dmd.
Mortiser, W&M No. 285—5 spindle horiz. dmd.
Mortiser, Sidney, single spindle pb. bd.
Mortiser, Greenlee No. 228 Vert. bd. & motor
Moulder, Amer. No. 35—10" bb. dmd.
Planer-Matcher, Yates A1-15"x6" rd. hds. pb. bd.
Planers, New Crescent 24" bb. dmd.
F & E No 156 36x7 DMD head
Redrier, Merritt 12 plate 36x72
Resaw, Connell & Dengler Circular pd. bd.
Router, Defiance, 2 spindle bb. dmd.
Routers, Carter, floor type, Hvy. duty, electric
Routers, Yates-Amer. U-9 high speed
Router, Yates-Amer. U9 bb. dmd., High Speed
Sander, Berlin, 31" 3 drum, roll feed bd.
Sander, Mattison No. 134, pb. bd.
Sander, Mattison No. 138 Belt, hand, bb, dmd.
Sander, New Jefferson, hand block, bb. dmd.
Sander, Smith 49" 3 drum endless bed
Sanders, F & E 60" 3 drum roll feed, dmd.
Sander, Oakley Model H, 12" Horiz. Drawer, bb., dmd.
Sander, Mattison No. 172 edge belt bb. dmd.
Sander, B & M 14 flat sander & motor
Sander, 48" double disc, dmd.
Sanders, McKnight sgl. drum 24"x16" dmd.
Sanders, Nash No. 25—10 spdle. dmd.
Sanders, W&M No. 171 belt, pb, bd. & motor
Sander, W&M No. 171 Hand Block, pb. bd. & Mtr
Sander, W&M No. 315 Edge Belt, bb., dmd.
Sander, Yates No. 427 Hand Block pb. bd. & Motor
Saws, Famous, cutoff, bb. dmd.
Saws, DeWalt cutoffs
Saws, New Delta-Crescent 12" tilt, arbor, dmd
Saw, Beach Dbl. Cutoff, 8' bb., dmd.
Saws, Buss Tilt table Variety bb. dmd
Saws, Yates G5 gang rip, pb. bd.
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Shaper, Defiance dbl. spdle., bb. dmd.
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Spray Booths, 3—7x8x7 DeVilbiss, comp.
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Tenoner, Hayes dbl. 6 ft. pb. bd. with copes.
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Tenoner, Jenkins No. 95, bb, bd. & Motor
Tenoner, F&E Sgl. with copes and motor pb. bd.
Veneer Eqpt., Black Bros. 24" Resin spreader, dmd.
Veneer Jointers, Jenkins Saw—6 ft. bd.
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Very large assortment of cutters, heads, etc. Like new, used less than 6 months.

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Merritt 66 Veneer Lathe, 3 Motors....$2500.
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McKnight Ladder Rung Tenoner Ser. No. 14-6834 with 1½ HP in and out Feed Motor and 2 Arbor Motors. Both 2 HP 3450 RPM with Controls for 3 Ph, 60 Cy., 220 Volts.

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If you have any special shop problems let us have the details. Often we can make helpful suggestions.

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Boss: "This is the end! You're fired!"
Worker: "Fired! I allus thought slaves was sold!"

A man who gives in when he is wrong is wise. A man who gives in when he is right is married.

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Andrews 6 spindles 8' Horiz. foot feed
Bell BBMD No. 24 Double end, boring & chucking and sawing 54" capacity Model 24-A
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Prybill—radial 1" to 12"
Single spindle horizontal

DOVETAILERS

Dodds 10, 15, 20 spindle

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American 12" Wedge Bed BB
American 16" Wedge Bed BB
12" Colloday L. Powers, HB Smith, Crescent Sidney

LATHES

Mattison 55C BB Live Tailstock

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Northfield chisel mortiser, motor driven
Wallace chisel mortiser, motor driven

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Mattison No. 224 9" all electric, hopper fd.
Eaglesfield 6" DMD BB All Electric
Yates American No. C5S—18" all electric
Yates American C5S 9" DMD All Electric
SA Woods No. 107 12" 5 heads, belt driven
S.A. Woods 701 all electric DMD12" x 4"
SA Woods No. 131 9", belt driven
American C4A 8"x4" B.D.

PLANERS

American Saw Mill Pony 24" 5 HP CMD
Buss 36"x8 No. 4ML DMD Motor, sectional feed roll, sectional chip breaker Knife Grinder
Buss No. 4 BB 30" single Sec Feed & Chip CMD knife Grinder
Northfield 24" single, MD motor fd. No. 5
Smith 24" Facing Planer MD BB Power Fd.

PLANER & MATCHER

Fay & Egan No. 156 20"x8" 6 hds., belt dr.

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Peerless 9" 14" and 20" horizontal
Peerless 9" 14" Vertical
Wysong & Miles, Oakley, Mattison belt
HB Smith 42" 3 drum, endless bed, MD BB No. 404
Solem No. 370 30" 2 drum
Yates 42" 3 drum Belt drive
Yates No. 431 30" 3 drum endless bed belt drive

SAWS - CUT OFF

Porter C43 5 HP DMD BB
Beach 5 HP DMD BB
DeWalt BB DMD 10 HP with water pump and 2 vises Metal Cutting Model ME-2
Heston & Anderson No. 5, No. 25 & No. 55
Multiplex 5 HP DMD BB
Unipoint 3 HP DMD BB
Wallace 2 HP DMD BB
DeWalt 1 to 5 HP DMD BB
Jenkins No. 105A double cut off and mitre saw, 96"x60" MD motor feed BB

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36" American, Tannewitz, Crescent, Oliver
27" Crescent Band Saw
Northfield BB & DMD 20" to 36"
Oliver 30" DMD Fully Guarded

SAWS - RIP SAWS

Diehl BB No. 77 DMD 15 HP
Sinker Davis, self feed gang, BB belt dr.
Hermance Straight Line Plain Bear., BD

SAWS - VARIETY

American Saw Mill 5 HP DMD Tilt Arbor
American No. 10 tilt top belt drive
BM Root tilt top belt drive
Mereen Johnson, double tilt arbor, DMD BB with carriage
50 other makes to choose from

ROUTERS

Ekstrom Carlson New No. 232 & No. 337
Ekstrom Carlson Nos. 156 & 434

SHAPERS

McCartney BB 1 spindle
L. Powers single BB - MD
Union Single spindle BB MMBD
Onsrud No. 200 Single 15,000 RPM
Whitney 2 sp. automatic BB MD No. 102
Whitney single 153 DMD and Belt Drive
Yates N2 BB MD

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Newman single end BD

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Electric Carpenter 5 machine combination all ball bearing motor driven.
NEW—Taylor caterpillar clamp carrier 60 sections, 6½' centers 32" wide clamps, air rotation.
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Crescent 20" Ball Br. New
Northfield, 20" M.D. new
Lehman 30" Bab. Br. $125.00
Crescent 36" belt or motor
Fay & Egan No. 345 36"
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7" Blades, 40 hp motor

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Andrews 32" Double Col.
Root Single Spl. Motor on Spl.
Root 2 spindle Horizontal Radial
Dennis Sgl. Vert. Universal
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Fay & Egan No. 316 20" Rd. Hd. M.D.
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Falls No. 103 St. Line B. B. Belt Dr.
Mereen Johnson No. 441 Gang
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American No. 15 24" single dr. Hand Feed
American No. 15 30" single dr. Hand Feed
Berlin 42" 3 Dr. Motor Vee Dr
Mattison No. 115 Variety Belt Sander
Wysong & Miles No. 171 Belt Sander
Yates American Comb. 15" disc & Drum M.D.
Yates No. 401 42" 2 Dr. Roll Feed
Wysong & Miles No. 303 Comb. 26" Disc

SHAPERS:
Crescent Single Ball Bearing M. D.
Crescent S-2 B.B. M.D.
Fay & Egan No. 265 Dbl.
Fay & Egan No. 552 Single Ball Bearing M.D.
Double Spdl., B.B. Mtrs. on spdl., 3000 or 7200 rpm
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Greenlee 4 ft. vertical gang borer
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Practically New Black Bros. 12" Motor Driven Edge Glue Spreader
New Union Conveyorized Edge Glue Spreader
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Yates-American 16" No. 1 Direct Motor Driven Ball Bearing Hand Jointer
Porter 6" Direct Motor Driven Ball Bearing Hand Jointer

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Mattison 36" No. 55-C motor drive ball bearing
Large quantity Mattison Lathe Heads with carriers and knives

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Wysong & Miles No. 288 direct motor driven 6-spindle mortiser
Wysong & Miles No. 286 Hinge Seat Mortiser
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MOULDERS

Vonnegut 4" electric Moulder
Yates-American 4" Type C-88 Electric Moulder
Mattison 6" No. 276 Electric Moulder
Newman 6" No. 46 Electric Moulder
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Morgan 12 Track 30" open back Clincher
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2 Doig 5 Track Closed Back Nailers
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New Crescent P-24 Direct Motor Dr. with Grinder
Whitney Ball Bearing Direct Motor Driven
Greenlee 36" No. 110
Yates-American 24" No. 1 Direct Motor Driven Ball Bearing Facer with Four Post Herzog Feed

DOUBLE PLANERS

Yates-American 30" No. 177 Ball Bearing Direct Motor Driven with electric Knife Grinder

SANDERS

Yates-American 43" No. 431 Direct Motor Driven Endless Bed Sander
Mattison No. 124 Automatic Stroke Sander
Pearson Waterfall Sander
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BAND RESAWS

American No. 4 Band Resaw

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Mereen-Johnson No. 300 Electric Chain Feed Double Cut-Off Saw and panel sizer
Yates-American No. 51 Direct Motor Driven Swing Saw
Beach Direct Motor Driven Ball Bearing Double Cut-Off Saw

RIP SAWS

Mattison No. 207 Direct Motor Driven Ball Bearing Glue Joint Rip Saw
American No. 15 Ball Bearing Chain Feed Rip Saw
Mereen Johnson No. 441 Ball Bear. Gang Rip Saw

MITRE SAWS

Bell No. 12 Direct Motor Driven Ball Bearing Double Miter Saw

SHAPERS

New Crescent Type S-2 Single Spindle Shaper
Whitney No. 139 Double Spindle Electric Shaper
Whitney No. 251 Double Spindle Electric Shaper
Whitney No. 234 Double Spindle Electric Shaper
Whitney No. 393 Automatic Single Spindle Shaper
Onsrud W-125 Double Spindle Automatic Shaper
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TENONERS

Fay & Egan No. 505 Direct Motor Driven Ball Bearing Single End

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Superior 42", ballbearing, Motor Driven
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Andrews 60" 6-Spindle, Horiz., DMD Power Feed
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American 2-spdl., adj., radial, Motor Driven
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Superior 2 Spindle Adjustable Radial, BB, D.M.D.
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Taylor 12-Section, 6½' wide, 4-32" clamps per sec.
Taylor 20-section, 7½' wide, 4-32" clamps per sec.
Taylor 40-section, 7½' wide, 4-32" clamps per sec.
Taylor 40-section, 6½' wide, 4-38" clamps per sec.

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Bell No. 7 Automatic Gluer and Dowel Driver (for sash and door.)
Bell No. 8 Auto. Gluer & Dowel Dr., Dir. M.D.
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Nash No. 4 Dowel Rod Sander, Motor Driven

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American 24" Ballbearing, Round Head, Motor Driven, with Billstrom Feeder

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Diehl No. 60, Continuous Chain Feed, B.B., DMD
H & A 6" Round Head, B.B. Motor Driven
Fay & Egan No. 217, Continuous Chain Feed
American 12", Round Head, Motor Driven

JIG SAWS
Oliver No. 173 Self-contained, D.M.D.

MORTISERS
Greenlee No. 228 Vert., Hollow Chisel, M.D.

MOULDERS
American No. 1, 4", 4-Side, Motor Driven
American No. 1, 6", 4-Side, Motor Driven
American No. 35, 7", 4-Side, All Electric, B.B.
Mattison No. 262, 6", 4-Side All Electric B.B.

PLANERS
Buss No. 4, 30" Single Cabinet, Motor Driven
Superior 28" Single, Motor Driven
American No. 112, 30" single, Motor Driven
Yates No. 156, 26", Single Cabinet, Motor Driven

ROUTERS
Porter No. 502, 2-spdl., B.B., D.M.D.
Porter No. 600 High Speed, Ballbearing, DMD

SANDERS
Smith 43", 3-drum Endless Bed D.M.D.
American No 2, 24" Disc and Oscillating Spdl.
American No. 5 Drum Sander, D.M.D.
Ekstrom Carlson No. 23 Scroll Sander, BB, DMD
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Mattison No. 138 Hand Block Belt, Motor Driven
Mattison No. 172, Oscillating Edge Belt, M.D.
Pryibil 20" Herizontal Belt, Motor Driven
Pearson Model A Universal Edge Moulding Sander, B.B., D.M.D.
Yates No. 430, Hand Block Belt, Motor Driven

SAWS—CUT-OFF
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Buss Double End, Motor Driven
Racine Floor Type—Motor Driven
Fay & Egan Double End, Motor Driven
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SAWS—RIP
American No. 15 Chain Feed, Motor Driven
Defiance No. 21-D Chain Feed—Motor Driven
Diehl No. 75 Chain Fd., Str. Line, B.B., D.M.D.
Mattison No. 207 Chain Feed, Ballbearing, DMD

SAWS—VARIETY
American No. 1, Tilting Table, Motor Driven
Dodds Tilting Table, Motor Driven
Pettingell, Tilt Arbor, Roller Table, M.D.

SHAPERS
Whitney No. 393 Automatic, Single Spindle, BB, DMD, with Frequency Changer
Onsrud W125 72" Automatic, multiple stations, B.B., Direct Motor Driven, with freq. changer
Buss, Sgl. Spdl., Hi-Speed D.M.D., B.B.
Oliver Sgl. Spdl., Hi-Speed D.M.D. B.B.

TENONERS
American, Single End, Tenon Heads, M.D.
McKnight No. 7IC Chair Back Tenoner, M.D.
Towsley Single End, Tenon heads, lower cope, cut off saw, Motor Driven

VENEER MACHINERY
Black Bros. No. 116 42"x84" Electric Veneer Press
Black Bros. No. 115 36"x84" Electric Veneer Press
Dennis Continuous Feed Veneer Jointer, M.D.
Dennis Veneer Taping Machine, Motor Driven
Jenkins-Falls Veneer Jointer, B.B., Motor Driven

MISCELLANEOUS
Mattison No. 231 Univ. Cutterhead Gr., D.M.D.
Auto-nailer, Floor Type, Direct Mtr. Driven, B.B.
Bell No. 13 Dovetail Gluer.
Black Bros. No. 115 36"x84" Electric Veneer Press
Black No. 5, 12" Edge Glue Spreader, M.D.
Sturtevant 48" Exhaust Fan, Motor Driven
Mattison No. 378 Universal Cutterhead Grdr., DMD

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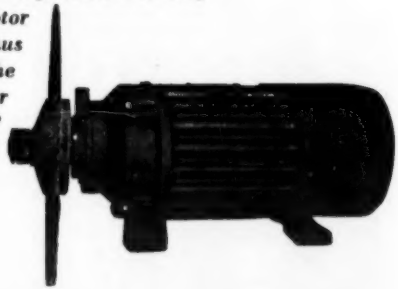

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Doig 9-Track Nailer, C.B., M.D.
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Saranac Single Head Stapler, M.D.
C. & D. 24" Two color Printer, M.D.

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Handy Case Clamps, 48" Capacity
Handy No. 160 Frame Clamp
Handy Dual End Clamp, 36" Capacity

JOINTERS
Union 6", B.B., D.M.D.
Sidney 16", B.B., D.M.D.
Jenkins No. 343A Glue Jointer, B.B., D.M.D.

MORTISERS
Loeffler No. 600, Motor Driven
F. & E. Hollow Chisel, M.D.
Greenlee No. 227 Hollow Chisel, M.D.
Greenlee No. 228 Hollow Chisel, M.D.

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Whitney 30", Sgle., Cabinet, Plain brg., M.D.
Yates No. 156-30" Sgle., Cabinet, B.B., D.M.D.
Smith 30", Single, Cabinet, B.B., D.M.D.
Buss No. 4A, 36" Single Cabinet, B.B., D.M.D.

ROUTERS
Eckstrom-Carlson No. 223, B.B., M.D.
Eckstrom-Carlson No. 327, B.B., M.D.
Onsrud No. 240-D, B.B., M.D.

SANDERS
Nash No. 10—6 sp. Automatic Turning, M.D.
Solem No. S3M, 42" 3-drum Endless Bed, Spiral Drums, M.D.
Berlin 60" 3-drum, Roll Fd., Spiral Drum, M.D.
American No. 9, 3-drum, 61" Roll Feed, D.M.D.
Mattison No. 124, 6' Auto. Stroke, M.D.
Indiana No. 12 Edge Belt, B.B., D.M.D.
Mattison No. 138 Hand Block, M.D.
Mattison No. 137 Hand Block, B.B., M.D.

SAWS
Tannewitz 36" Band Saws, B.B., D.M.D.
Porter C-43, Cut-off Saw, B.B., D.M.D.
Mattison No. 244 Cut-off Saw, B.B., D.M.D.
Hermance No. 36 Chain Feed Rip Saw, D.M.D.
Bell No. 12 Double Mitre Saw, B.B., D.M.D.
Tannewitz Tilting Arbor Saw, B.B., D.M.D.
Buss Variety Saw, Tilt. Table, B.B., D.M.D.

SHAPERS
Crescent No. S-2, Single Spindle, B.B., mtzd.
Sidney 2-spindle, B.B., motorized
Onsrud W-226 Buck Shaper, B.B., D.M.D.

TENONERS
Jenkins No. 95, 48"x90" Double End, with upper scoring saws, B.B., D.M.D.
Hayes Single End, tenon heads, upper and lower cope spindles and cut-off, M.D.

MISCELLANEOUS
Merrit 36"x72", 6-plate Redrier
P. & B. Ring Machine, B.B., M.D.
Jenkins No. 126 Combination Boring, Glueing, and Dowel Driving Machine, M.D.

GAYNES ENGINEERING COMPANY

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NEW MACHINES—IMMEDIATE DELIVERY

Hand Jointers — **Mitre Saws** — **Self-Feed Rip Saw**
32-in. Circular Resaw — **Electric S. E. Tenoner** — **24-in. Single Planer**
Multiplex Saws and Delta Machines

BAND SAWS
Tannewitz-Greenlee-American-Crescent-Moak 36" BB M.D.
American 42" V-belt, motor drive.
Tannewitz 42" M.D.
West Side 36-in. V-belt, M.D.

BAND RIP AND RESAWS
Yates No. 312 44" chain-feed hand rip.
McDonough 62" Vertical Band Resaw.
Mershon 42" Twin Band Rip B.B.

BORING MACHINES
New Wysong and Miles sgl-spdl. vert., d-m-d.
Greenlee 363-6 spindle, Univ. Vertical M.D.
Root "B-M" 16-spindle, cluster hd. motor dr.
Greenlee 356-P Single Ver. power feed.
Andrews 60" Vertical gang power feed.
Andrew single-spindle vertical, motor-drive

BLOWERS AND FANS
American No. 80E with 40 h.p. coupled motor.
Clarage type IE Model II Ball Bearing.

CLAMPS—GLUE ROOM EQUIPMENT
Greenlee No. 599 frame and furniture clamp.
Black Bros. 30-section, 10-ft., power-feed, ten Style E clamps per section, jaws 7-in. high, opening 24-in.
Taylor 6-ft. 12-sec. wheel type clamp carrier.
Francis 4'x8' Hand screw Veneer Press, 20 scr.

FILING ROOM MACHINERY
Black Diamond band saw filer
Rogers 38" cup wheel auto. knife grinder.
Hanchett No. 608 lap gr. b.b. max. cap. 8" wide
Covel-Hanchett No. 325 thin knife grinder.
Black Diamond No. 5 circular saw filer, m-d.

JOINTERS
American "Clement" 8-in. long tables.
Yates No. 213 Continuous feed direct m.d.
Meyers continuous feed V-belt M.D.
Porter, American, Oliver, Sidney, Fay & Egan, from 8" to 30" wide—several have feeding attachments—tell us what you need.
Yates No. 199, 20-in. rd.-hd., V-belt, m-d.

LATHES
Defiance 18x72' Pattern Maker M.D.
Whitney 50-in. backknife, gage, lathe.
Yates-American T5 Auto. Shaping, M.D.
Blount 6-in. 6-ft. speed lathe.
Oliver 12"x6' bed speed lathe, d-c mtr. in head

MORTISERS
Greenlee No. 228 vertical automatic H.S., m-d.
New Britain No. 2 Chain, with motor

MOULDERS
Yates No. C3 4" fast feed, belt drive.
Yates No. 108 10" belt drive coupled motor
Hermance 6" Ball Bearing with motor.
Newman 4"x4" all Electric.
Yates No. C-89 10"x4" all Electric.

NAILING MACHINES
Morgan 18 track open back cleater, M.D.
Auto Nailer "Blue Model" M.D.

PLANERS
Yates Amer. J 18, 18" single B.B. D.M.D.
Yates No. 156 20" dr. hd. m.d.
F & E No. 156 24-in. single, dir. m.d.
Buss No. 4A 36" 6-roll single D.M.D.
Buss 6A 36" 6-roll single dir. m.d.
Berlin No. 177, 30x12" double belt dr.
American No. 80, 15-in. double, heavy duty.
Sidney 24" Rd. Head V-Belt Mtr. Dr.

ROUTERS
Carter Type TR, motor-drive 15,000 r.p.m.
Ekstrom-Carlson No. 126, ball brg., motor-drive

SHAPERS
Whitney No. 134 double-spindle dir. M.D.
Amer. No. 20 dbl-spdl. dir. M.D. Freq. Chgr.
Whitney No. 165, s.s., motor on arbor.
American dbl. spindle, belted m.d.
Onsrud W-248 single, ball bearing, m.d.
Whitney No. 282 Sgl. D.M.D. 56"x40" table
Onsrud W 125 Automatic 84" Cap.
Porter No. 103 single, ball-bearing, motor-drive

SANDERS
Yates 401-49" roll feed, M.D.
Salem No. 370 43" 2 drum End. Bed.
Fay & Egan 30", 3-drum, roll-feed
Mattison No. 124, 6-ft. auto. stroke, m.d.
Buss 2-spindle vertical, oscillating belt drive.
Wysong & Miles No. 164 universal belt, m.d.
Yates No. 421, 49-in. 6 drum with motors.

MITRE SAWS
American No. 1 tilt table V-Belt M.D.
Union Tilting Arbor direct M.D.
Tannewitz tilt table motor on arbor.
Wallace 8" tilt-arbor, 1-h.p. 1-ph. motor.
American Dbl. revolving Arbor 5 HP Belted mtr.
Whitney No. 77 tilting arbor, direct m.d.

CUT-OFF SAWS
De Walt Radial Arm, 5 HP motor.
Jenkins No. 97, 103x48" double-end, chain-feed with copes, direct motor-drive
Greenlee No. 451 auto. cut-off and dado.
Buss double cabinet type, motor drive.
Porter 43-20S 36-in. stroke, motor on arbor.
Oliver No. 94 straight line, direct mtr. dr.
Beach No. 142 Boxmakers, rolling table, D.M.D.

RIP SAWS
Newman No. 37A power feed, b-b, motor-dr.
Hermance self-feed, V-belt motor drive

TENONERS
Greenlee 535 Saw Tenoner, dir. M.D.
Greenlee No. 534, tilting spindles, dir. m-d.
American single-end with copes, rolling table.
Jenkins No. 95 double end, jump dado, d.m.d.

This is only a partial list — send or call your inquiries

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REBUILT AND USED MACHINES

BAND SAWS
Oliver No. 116, 36" D.M.D.
American B-36, 36"
Colladay & Crescent 36"
Jones-Superior No. 155, 42" M.D.

BORERS
Root "GM" Vertical Single Spindle
Towsley No. 3, 2-Spindle Horizontal Radial
Greenlee No. 368, 2-Spindle Horizontal M.D.
Keystone 3-Spindle Horizontal 1" centers

CARVER
Minnesota 20-Spindle Multiple Carver

CLAMPS
American 4'x8' Door Clamp
Lancaster No. 500 Air End Clamp

CLAMP CARRIERS
Taylor 7½ Ft. 40-Sec. Chain Type

DOVETAILERS
Dodds 10-Sp. spiral gear drive.

GLUING MACHINES
Black 30-Gal. Gold Resin Glue Mixer

JOINTERS
6", 8", 12", 16", 20" sizes
30" with Billstrom Feeding Attachment
Yates Continuous Feed Glue Jointer

LATHES
Reed 16" Turning Lathe, 16" Swing

MORTISERS
Fay & Egan No. 462 P.F. Hollow Chisel
Wysong & Miles No. 181, 6-Spindle
American No. 10 Sash Mortiser & Relisher

MOULDERS
Hermance 6" 4-Side
4" & 6" Single Head Stickers

PLANERS
24", 30" and 36" Single
Yates B-8 30" Single B.B. D.M.D.
Whitney 30" Double

SANDERS
Nash No. 64 Automatic Turning
Curtis No. 11 Semi-Auto. Belt Sander
Curtis No. 6 Belt Sander, M.D.
Porter-Cable B-6 Irregular Belt
American No. 2, 43" Roll Feed 3-Drum

SAWS—CUT-OFF
Porter Floor Type, with Table
Y-A C-44 Floor Type, with table
Root No. 248 Double, 32"x82"
Bell No. 12 Double Miter

SAWS—CHAIN FEED
Mattison No. 205, Motor Driven

SAWS—SELF-FEED
Root and American
Hermance No. 31 Adjustable Roll
Greenlee No. 426

SAW TABLES
Tannewitz SJ Tilting Arbor
American Double Revolving Arbor
American No. 7½ Comb. & Dado
Beach D.M.D., Tilting Table

SHAPERS
Whitney No. 8 Double Spindle
American No. 1 Single Reversible
Shimer Single Spindle Reversible

TENONERS
Fay & Egan Single End
Colladay & American Single End

VENEER JOINTER
Jenkins No. 23 D.M.D. Ball Bearing

B. M. ROOT CO., YORK, PA.

FURNITURE SALES GOOD—PROFITS OFF IN 1951

Home furnishings volume held up very well during 1951 in the manufacturing, retail and wholesale fields, but profits will show a sharp drop from 1950, when records are set in both sales and net after taxes. The reports are based on 11-month records of producers, merchants and distributors, with estimates for December included. Here is the breakdown:

Furniture manufacturers will show a dollar gain of six percent over 1950, in shipments.

Furniture stores will be about five percent under 1950 in sales; sales of furniture will run ahead of last year, but appliances, television and floor coverings brought the store-wide average down.

Department stores are showing a one percent gain in sales, but net profit after taxes is off at least 50 percent from 1950.

Furniture wholesalers' shipments are off 1.4 percent from 1950.

Early in December, furniture store inventory was only three percent ahead of the same period in 1950, and by January 1, should be under, for the first time in a year. Wholesaler inventories dipped under 1950 for the first time in December, running three percent less than a year ago.

Accounts receivable were down, and collections have been improving for most branches of the industry in recent months.

Home goods profit drops may be attributed to four major causes: 1) sacrifice of merchandise to move goods; 2) effects of price controls; 3) heavier tax burden; 4) strong freight rate increases by both railroads and truck lines. An additional drop in both volume and profit was due to restriction of critical materials.

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BORERS—Horizontal & Vertical
Towsley two-spindle horiz. radial borer.
• Oliver No. 71—3-spindle horizontal borer.
Greenlee No. 368—30" Mult. Horiz. Borer.
Andrew 48" & 72" Mult. Horiz. Borer
• Wysong & Miles No. 283-B Vert. Sgl. Spl. Borer.
• Greenlee No. 386 6-ft. and 8-ft. vert. multiple borers
• Root Style B vertical multiple hood borer.
• Greenlee No. 369—48" Vert. Mult. Borer.
Andrews 60" multiple vertical borer.

CHAIR MACHINERY
• McKnight double end sawing and boring machine.
• McKnight 4CM horiz. and vert. borer with double end sawing.
Pringle & Brodie horizontal borer.
McKnight No. 1E saddle seat machine.
Bell No. 8 dowel gluer and driver
Dauber-Bell dowel cutter and pointer.

CLAMPING MACHINERY
Taylor-Rilistrom-Black 12-18-30-40 section clamp carriers.
Handy No. 447 Air Operated, 2-Way End Clamp.
Handy and Union revolving case clamps.

GLUE MIXERS & SPREADERS
Francis M-7 (75 gallons) Veg. Glue Mixer.
Union 36" and 60" Dbl. Roll Resin Glue Spreaders.
Francis 12-in. edge glue spreader.

JOINTERS
• Fay & Egan No. 506—12" hand jointer.
• Yates-American No. 213 Glue Jointer.
• Diehl No. 60 glue jointer.

LATHES
• Mattison No. 55-C Auto. Turning Lathe, B.B.
Mattison No. 210 copying lathe.

MORTISERS
Greenlee No. 228 Auto. Hollow Chisel Mortiser.
New Britain No's. 2 and 7 chain saw mortiser.
• Whitney No. 67 horiz. osc. bit mortizer.

MOULDERS
• Mattison No. 276—6-in. electric moulder.
• Vonnegut 6-in. electric moulder.
• Yates No. 108—10-in. heavy-duty moulder.
Yates C3A-4" BB Belt Drive Moulder.
• Hermance No. 50—8" drop bed moulder.

PLANERS—Facing
• Whitney No. 32—30" single planer.
• Porter 24" facing planer—Herzog feed.

PLANERS
• NEW Whitney No. 32A—30-in. single planer.
• Whitney No. 29—36-in. single planer.
• Greenlee No. 110—30" 6-roll single planer.
• Whitney No. 24—30" and 36" Double Planer.
• Whitney No. 33—40" Heavy Duty Dbl. Planer.
• Yates-American No. 177—30" roughing planer.

ROUTERS
• Onsrud W-240 heavy duty electric router.
• Porter No. 600 and 610 heavy duty elec. router.
• Yates-American U-9 electric router.
• Onsrud W-265 Electric Router.

DRUM SANDERS
• Smith No. 404A—31" 3-drum endless bed sander.
Yates No. 431—31" and 43" 3-Dr. End. Bed Mtrzd.
• Solem S-3-M—73" 3-Drum Endless Bed Sander.
American No. 9—61" 3-drum roll feed sander, mtrzd.

SANDERS—Belt & Miscellaneous
• Wysong & Miles No. 603 Automatic hydraulic stroke
Curtis No. 8 semi-automatic stroke sander
Mattison No. 124 Auto. Stroke Sander.
• Wysong & Miles No. 277 hand block belt sander.
Nash No. 10 & No. 25 Auto. Spindle Sanders.
American No. 11 horiz. surface sander.

SAWS—Band Scroll & Resaws
• Superior 36-in. band saw—Carter wheels.
• Fay & Egan No. 50—36" band saw.
• McDonough 44" vertical band resaw.

SAWS—Cut-Off
• Porter 23-20J Hydracut saw.
• Porter 43-20S straight line cut-off saw.
• Yates-American G-44 straight line cut-off saw.
• Jenkins No. 105-A Dbl. Cut-Off and Mitre Saws.
Mereen-Johnson No. 435 6-ft. multiple cut-off saw, groover, and equalizer.

SAWS—Rip
• Diehl No. 75 straight line ripsaw.
• Mattison 205-207 and late model 202 straight line ripsaws.
• Yates-American G-77 straight line ripsaw.
Greenlee No. 426 self-feed ripsaw.

SASH & DOOR MACHINES
Bell No. 5-B stile and rail borer.
• Bell No. 11 power door clamp.
Bell No. 7 dowel driver and gluer.
Milbury pocket cutter.

VARIETY SAWS
• Whitney No. 61 tilting arbor variety saw.
• Fay & Egan No. 500 tilt-table variety saw.
• Tannewitz tilt-table variety saw, b.b.
• Baker Double Arbor Variety Saw, BB.
• Yates-American No. 8 saw and dado machine.

SHAPERS
• NEW Crescent No. S-2 Single Spindle Shaper.
• Porter No. 103 Single Spindle Shaper
• Porter No. 201 Double Spindle Shaper
• Greenlee No. 180 Double Spindle Shaper.
• Whitney No. 351 double spindle, 12½ HP motors
• Whitney No. 293 Automatic Single Spindle Shaper.
• Onsrud No. 124 automatic single spindle shaper.
• Whitney No. 262 automatic double spindle shaper.

TENONERS
Greenlee No. 531 single end tenoner.
• Wilkin-Challoner No. 70 - 84" double end tenoner.
Jenkins No. 96 60-in. double end tenoner, b-b.

VENEER EQUIPMENT
Dennis No. 2 veneer taper.
Francis 30"x72" Hyd. Veneer Presses.
Merritt 84x54—8—10—12 Plate Redriers.
Plycor (Friz.) tapeless veneer splicer.
Francis 30x80-in. hand screw veneer press.
Large quantity "I" beams and turnbuckles.

MISCELLANEOUS MACHINES
• Jenkins No. 65 sash sticker.
Food Machinery Co. Model AC-2 boxmaker.
• Woods No. 227 side head grinder.
NEW Hanchett No. 133 Auto. Band Resaw Sharpener
This is only a partial list. If the machine you want is not shown, write us.

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Band Scroll & Resaw, 42", F. & E. No. 146, mtr.
Belt Sander, Wysong & Miles No. 275, b.b., 5 h.p., 1200 rpm mtr., used three months
Borer, vert., dbl. col., Andrew No. 75, b.b., automatic, 60", 10 h.p., 850 rpm mtr.
Borer, horiz., 2-spindle, Oliver, mtr.
Borer, horiz., Andrew 60", 4-spindles
Boxboard Printer, C. & D., 24", 1-color, ch.-fd.
Boxboard Matcher, Morgan, 12 roll
Clamp, Handy No. 195, mitre
Cut-off Saw, double, Buss 72"
Cyclone, 8" wide by 9½' high, with mtr. & blower
Dowel Machine, ballb., Hawker No. 2, two mtrs.
Jointer, incline bed, Newman No. 60, 16", 5 h.p. motor on cylinder
Lathe, automatic, Imperial 31", 10 h.p., ballb.
Lathe, autom., Mattison No. 57-B, 42", ballb.
Lock corner cutter, double end, B. & M., autom.
Mortiser, h.c., vertical, Moak
Mortiser, chain-saw, New Britain No. 3
Nailers, Morgan & Doig, 6 to 24-track, closed and open back with and without clinchers
Panel Raiser, F. & E., hand-feed
Planer, single, F. & E. No. 156, ballb., 24"x7", round head, 10 h.p., electric grinder
Planer, single, Yates-American B-7, 30"x7", 4-kn. rd. cyl., 20 h.p., 3600 rpm mtr., 7½ h.p. feed mtr., will feed 110 FPM.
Planer & Matcher, 4-s., F. & E. No. 40, 24"x6"
Ripsaw, self-feed, Sinker-Davis, 10 h.p.
Ripsaw, chain-feed, Diehl No. 75, two motors
Router, electric, Porter No. 612, 3 h.p.
Sander, 3-dr., e.b., Sheboygan 49", ballb., mtrs.
Sander, 3-dr., e.b. Smith 43", mtrs.
Sander, 2-dr., Parks 36", F. & E. 24"; Beach 38", ballb., c-upled motors
Sander, horiz., flat belt, B. & M., 20", 7½ h.p.
Sander, horiz., edge belt, Indiana, ballb., mtr.
Sander, semi-autom. stroke, Oakley Model D, 3 h.p. reversible mtr.
Sander, autom. stroke, Mattison No. 124, 8-foot
Saw, mitre, dbl.-end, Dauber-Bell, 72"
Shaper, 2-spindle, Whitney No. 134, freq. changer
Shaper, 1-spdl., h.s., Onsrud W-248, 6 h.p.
Stapler, Saranac 4-head, 60", openback
Surfacer, dbl., Egan 26"x12", endless bed
Tenoner, single-end, Greenlee No. 532-A, 4 mtrs., used one week
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Mattison No. 53-C—30" Ball Bearing Auto- matic Shaping Lathe
Mattison No. 57-D - 42" Ball Bearing Automatic Shaping Lathe
Jenkins No. 65 Ball Bearing Sash and Door Sticker
Jones-Superior No. 35 Two Spindle Horizon- tal Borer
Yates S-7—6' Hand Lever Stroke Sander
Jones-Superior No. 145—30" Disc Sander
Diehl No. 75 B.B. Straight Line Chain Reed Rip Saw
Buss Double Cut-Off Saw
Wilkin-Challoner 72"x40" Electric B. B. Double Cut-Off Saw
Tannewitz 42" Ball Bearing Band Saw
Greenlee No. 495 BB Variety Saw
Whitney No. 77 Ball Bearing Tilting Arbor Variety Saw
Greenlee No. 110—36" BB, DMD Single Planer
Whitney No. 24—30" Motor Driven B. B. Double Planer
Porter 300-CM—24" Facer with Herzog Feeder
Fay & Egan 24" Jointer, with 7½ H.P. motor and Jointer Attachment
Mattison No. 244 BB Cut-Off Saw
Beach Wood Frame Variety Saw
Billstrom 6' 39 Section Clamp Carrier
Billstrom 7' 29 Section Clamp Carrier
Taylor 19 Section Revolving Clamp Carrier

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Guaranteed Used Machinery

Band Saw, 36" Hall & Brown No. 120, belt drive
Band Saw, New Northfield 20" ball bearing
Band Saw Delta and Boice-Crane 14", new.
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Boring Machine Oliver Vert. sgl. spdle. D.M.D.
Boring Machines, 2 spdle. horizontal belt and M.D.
Box Board Matcher, Mercen-Johnson No. 315—16 Rolls.
Carriage cut-off saw, Beach, roller table
Chucking Machine, Smith, 3 HP motor
Jointer, 24" Crescent, Belt Drive
Jointer 6" Yates-American No. B-11 with 3 phase motor
Lathe Auto. Yates No. 87-42" with heads and motors
Lathe, Auto. Berlin with heads, B.D.
Lathe, Propeller Fahlin 10' motor drive with wood patterns and jigs
Lathe, Waymouth, Automatic
Moulder, Yates C-4"—4 side belt drive
Planer, DBL. Yates No. 177 - 30x12" Belted Motor Drive
Planer single Fay & Egan 24x6 with 5 HP single phase motor
Planer and Matcher, 15"x6" Hall & Brown No. 209 with double profiler 6 knife round cyl.
Planer, New Powermatic 12x4" M.D.
Planer, single 16x6" Powermatic, New
Planer, single 24x6 Northfield No. 5, New
Planer, 12x4" Boice Crane No. 1022, New
Delta 14" Drill Press with motors
Radial Saw, Wilson floor model, 5 HP, 3/60/220
Radial Saws, New Multiplex No. 20A-30A-40A and 40B, single phase, 110-220 volts
Rip Saw, Chain feed, Yates G-2, B.B., M.D.
Rip Saw, Beach hd. fd., Wood Frame, 5 H.P. mtr.
Sander, Belt, Auto., Curtis 6'
Sander, Nash No. 87-20"—4 spindle auto M.D.
Sander, Belt, Mattison hand block roller table
Sander, Fay & Egan belt, No. 553, Hand Block
Saw Scroll, F&E Self Combined, 36" throat.
Saw Table, American No. 20, Double Arbor
Saw, Swing, H. & A. No. 5—10", New
Saw, Swing, H. & A. No. 25—14", New
Saw, Swing, H. & A. No. 55—16", New
Shaper, Crescent single spindle, M.D. New
Shaper single spindle Fay & Egan No. 252 with 5 HP 3 phase motor
Shaper dble. spindle Whitney with freq. changer
Shaper, American No. 20—with 2—5 HP motors
Sticker, One hd., 6" sgle., Y&F belt drive
Tenoner double end 120" Wilkins-Challoner with lower copes, cut-off saws with motor
Tenoner, single end American No. 2½ with copes and cut-off and 7½ HP motor V-belt drive.
Tenoner, single end Hall & Brown No. 55 with copes and cut-off, belt drive
Tilt Arbor Saw, 12" Davis & Wells, M.D.
Tilting Arbor Saws, New Delta, Atlas & Darra-James

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Sidney 16" D.M.D., B.B., Hand Jointer
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Yates C-88 — 8"x4" Electric B.B. Moulder
Yates-American 57 D.M.D., B.B., Hand Lever Stroke Sander
Greenlee No. 495 Direct Motor Driven Ball Bearing Tilting Arbor Saw
Porter No. 300CM Motor Driven Ball Bearing 24" Facing Planer
Buss No. 4A - 36" Motor Driven Ball Bearing Single Planer
Hermance No. 44 25" M.D., B.B. Sgl. Planer
Onsrud W-240 High Speed Electric Router
Porter No. 612 High Speed Electric Router with 2 h.p. motor
Superior No. 145—30" Motor Driven Disc Sander, tilting table.
Porter No. 43-20J Motor Driven Hydra-Cut Saw with tables
Mattison No. 138 Direct Motor Driven Hand Block Belt Sander
Indiana No. 12 Direct Motor Driven Ball Bearing Edge Belt Sander
Yates No. 430 D.M.D. Hand Block Belt Sndr.
Wysong & Miles No. 315 M.D. Edge Belt Sander, 1 hp.
Block Bros. 4x8 Pneu. Sash & Door Clamp
J. A. Fay & Egan No. 50—36" Band Saw Machine, vee belt motor drive.
Mereen-Johnson No. 465 Motor Driven Multi. Cross Cut & Dado Saw
Mattison No. 244 Direct Motor Driven Straight Line Cut Off Saw, w/Steel tables
Diehl No. 75 Direct Motor Driven Ball Bearing Straight Line Ripsaw
Tannewitz 42" Direct Motor Driven, Ball Bearing Band Saw
Tannewitz Type GH and G3—36" Direct Motor Driven Bearing Band Saw
Tannewitz Type J Motor Driven Tilting Arbor Variety Saw
Tannewitz Type G 36" Direct Motor Driven Ball Bearing Band Saw
Greenlee No. 110—36" Direct Motor Driven Ball Bearing Single Surfacer
Bilistrom 29 and 39-section clamp carriers.
Whitney No. 24—30" Motor Driven Ball Bearing Double Head Surfacer
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Whitney No. 91 Motor Driven Ball Brg. Dbl. Spindle Shapers (2)
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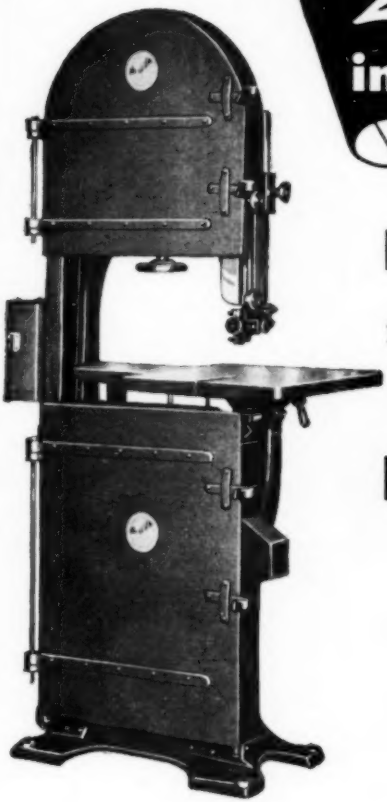

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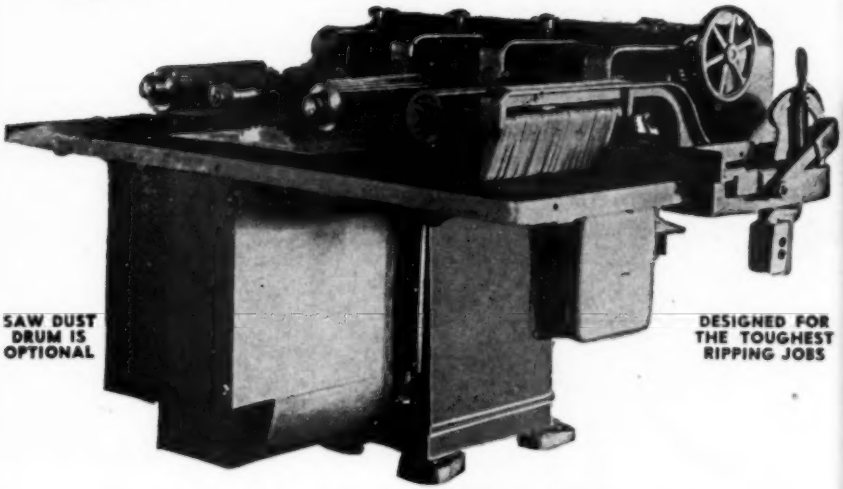

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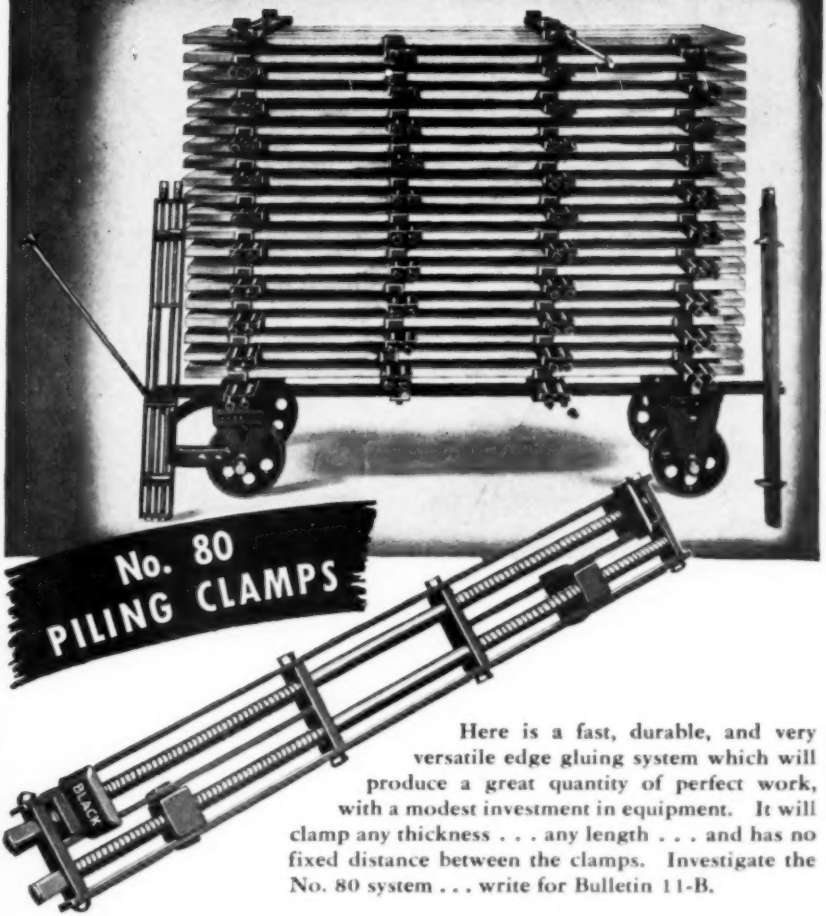

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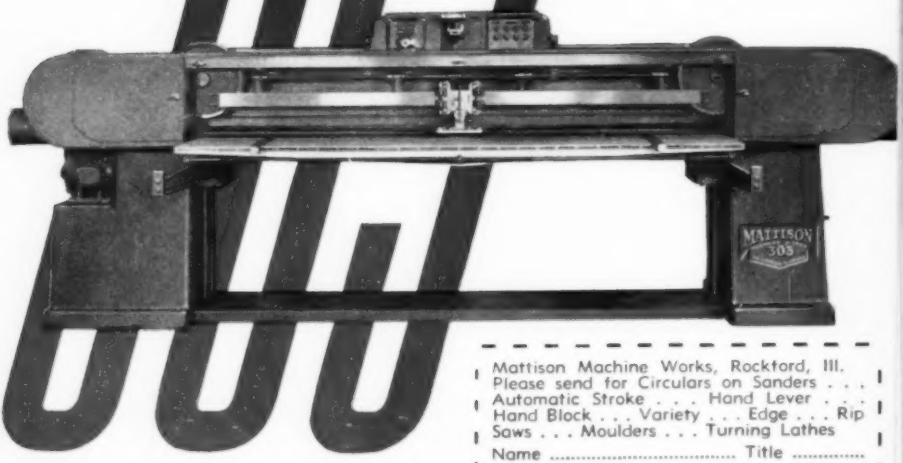

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